

PEDIATRIC MASSAGE AND HYDROTHERAPY TECHNIQUES

3

KEY POINTS

After completing this chapter, the student will be able to:

1. Understand the rationale for using Swedish massage, relaxation techniques, passive range-of-motion exercises, and skin stimulation with children.
2. Perform basic and advanced relaxation techniques prior to and during massage sessions.
3. Give a child a full-body Swedish massage that incorporates relaxation techniques, passive range-of-motion exercises, and different types of sensory stimulation.
4. Adapt massage techniques to individual children.
5. Explain how hot and cold applications affect the body.
6. Give examples of specific hydrotherapy treatments and understand what each is used for.

This chapter describes a variety of massage techniques that are especially appropriate for children. You will learn how to give a child a full-body Swedish massage, how to teach children to consciously relax, and how to perform a variety of hydrotherapy treatments.

SUITABLE TECHNIQUES FOR CHILDREN

Many of the same techniques that are useful for adults are also appropriate for pediatric massage; however, they may need to be modified for a child's physical, emotional, and cognitive differences. In this section, we discuss this modification of basic Swedish massage strokes, as well as the use of passive range-of-motion exercises and other specific techniques.

WHY USE SWEDISH MASSAGE WITH CHILDREN?

Swedish massage incorporates gentle passive touch, superficial fluid techniques (superficial effleurage), percussion strokes, deep neuromuscular techniques

such as petrissage, and passive range-of-motion techniques. It is relaxing, readily accepted by children, easy to learn, and easy to teach to parents. It is also versatile enough to be effective for a wide variety of problems, from touch issues to physical therapy needs. One particular advantage of using Swedish massage strokes, as opposed to many other styles of bodywork, is that they give both you and the child specific feedback about the child's soft tissue. With it, you will both be able to feel the mobility of the skin, the length and tonicity of muscles, adhesions if they are present, the relationship of different muscles and fascial tissue to each other, and the relationship between bones and the soft tissue overlying them.

In this pediatric version of Swedish massage, special techniques for sensory stimulation and relaxation training have also been incorporated. Emphasis has been placed on using great care so that children do not experience pain, and on constantly giving children choices about how they are massaged.

You should practice the whole-body sequence until the sequence and timing of the strokes are second nature to you. At that point, you will have not only the basic pediatric massage skills, but also an understanding of how to vary massage according to an

individual child's needs and according to your own intuition and creativity. Simple variables that allow you to individualize Swedish massage to suit different children are: the sequence in which different areas of the body are massaged; which layer of tissue you are working with; the amount of pressure you use; how much time you spend on each area of the body; the speed at which you do the strokes; how many times you do each stroke; and how you make transitions between different strokes. Over time, you will naturally develop your own style and will quite naturally weave techniques from other forms of massage and bodywork into your massage treatment to achieve particular goals with an individual child.

Lyse Lussier, a Canadian therapist from Montreal, has aided children with a wide variety of problems through the use of Swedish massage. During almost two decades of experience, she has worked with many normal healthy children, including her own, and with children facing many serious illnesses and disabilities. She has treated children in all stages of cancer, including immediately after diagnosis; during hospitalization for stressful treatments, such as bone marrow transplants; during recuperation at home from various treatments; during cancer reoccurrences; and during the terminal stages of the illness. She has also treated children undergoing renal dialysis and kidney transplants, children who are totally paralyzed, and children who are comatose and in long-term care. Her massage treatments have eased both physical distress (such as pain, nausea, and discomfort from being immobilized) and psychological distress (such as anxiety, lack of stimulation, insomnia, and feelings of isolation). Although Ms. Lussier occasionally incorporates other bodywork techniques, such as polarity therapy or craniosacral therapy into her practice, the basic modality that she uses is Swedish massage (Lussier L, personal communication, November 2002).

CONTRAINDICATIONS TO PEDIATRIC MASSAGE

Although massage with children is safe, contraindications must always be observed. Specifically, do not massage skin that has sores, cuts, burns, boils, or infectious rashes such as scabies. Do not massage inflamed joints, tumors, or any undiagnosed lumps. In the event of injuries (such as severe bruises, joint sprains, fractures, or dislocations) or medical conditions, consult with the child's doctor before you begin massage. Endangerment sites that should be avoided unless otherwise specified include the back of the knee, the xiphoid process, and the inner elbow. If a child is acutely ill, especially if his or her body temperature is elevated, massage is contraindicated.

BASIC MASSAGE STROKES

Basic massage strokes include passive touch, effleurage, petrissage, friction, and tapotement.

Passive Touch

Softly lay your warm, relaxed hands on the child's body and keep them still for about 30 seconds or more (see Figure 3-1). This meditative beginning is used to initiate touch in a gentle, noninvasive way. The warmth of your hands helps give passive touch a relaxing and nurturing feeling.

Effleurage

Effleurage strokes are done entirely with the palmar surface of your hands (see Figure 3-2). Rather than attempting to move deep muscle masses, your hands flow over the body contours, molding to them. Effleurage movements are smooth and continuous, and their effect is soothing and relaxing. Effleurage also increases lymph flow and aids venous flow. By using variations based on the amount of pressure and the direction and the speed of the stroke, effleurage is well suited for many different purposes. For example, if effleurage strokes are done slowly, they are sedating; rapid effleurage strokes are far more stimulating. Light (or superficial) effleurage has a different effect than deep effleurage. For example, at the beginning of the massage of each part of the body, light effleurage accustoms the child to being touched by you, helps you evaluate both the child's tissue and her response to being touched, and warms and relaxes the area. Deep effleurage, which may be used when the area is thoroughly relaxed and warmed, releases tension in deep muscles.



FIGURE 3-1 ■ Passive Touch.



FIGURE 3-2 ■ Effleurage. Notice that the entire palmar surface of your hands is in contact with the child's body.

Both superficial and deep effleurage can help increase a child's awareness of body boundaries (Chapter 1) by, in effect, outlining different body regions. An effleurage stroke of the arm, which goes from the hand to the top of the arm, sends a different message than an effleurage stroke that continues on to circle around the top of the shoulder. The first effleurage gives the child the sense that the arm stops just below the shoulder joint, whereas the second effleurage, by including the top of the shoulder, gives the child the message that the arm is longer and that the shoulder is an integral part of the arm.

Petrissage

Petrissage, which comes from the French word for kneading, is actually a category consisting of many different strokes that press, roll, squeeze, lift, wring, or knead soft tissue. Unlike effleurage, there is minimal sliding over the skin. Petrissage can release deeper tension than effleurage strokes, increase local circulation, help free adhesions and separate muscle fibers, and increase a child's awareness of the thickness and texture of deeper muscle layers. Because petrissage is a deeper stroke, it should not be attempted until the child is able to tolerate both light and deep effleurage. When doing petrissage, you should observe the child for any nonverbal signs of resistance, as well as ask

the child if the stroke is acceptable. The three variations of petrissage strokes are raking, kneading, and thumbstroking.

Raking

Raking is done on the back, arms, and legs. The fingers are curved and stiffened so that the hand looks like a garden rake (see Figure 3-3). Raking is begun at the top of the back or limb. The fingertips of one hand are dragged, with medium pressure, a short distance downward so that the fingers "rake" the tissue, then one hand is lifted off and the other hand does the same raking motion. Let the rakes overlap and work gradually down to the bottom of the area.

Kneading

Using medium pressure, grasp and lift a handful of flesh between the thumb and fingers of one hand (see Figure 3-4). Do not pinch, just squeeze gently. Slowly release as the other hand grasps the same tissue; lift and release it in turn. Continue with alternating hands.

Thumbstroking

This stroke covers smaller areas in a specific and thorough way, and may help you discover small areas of deep tension that cannot be as readily felt with effleurage. The area is stroked first with the flat of one thumb and then with the flat of the other

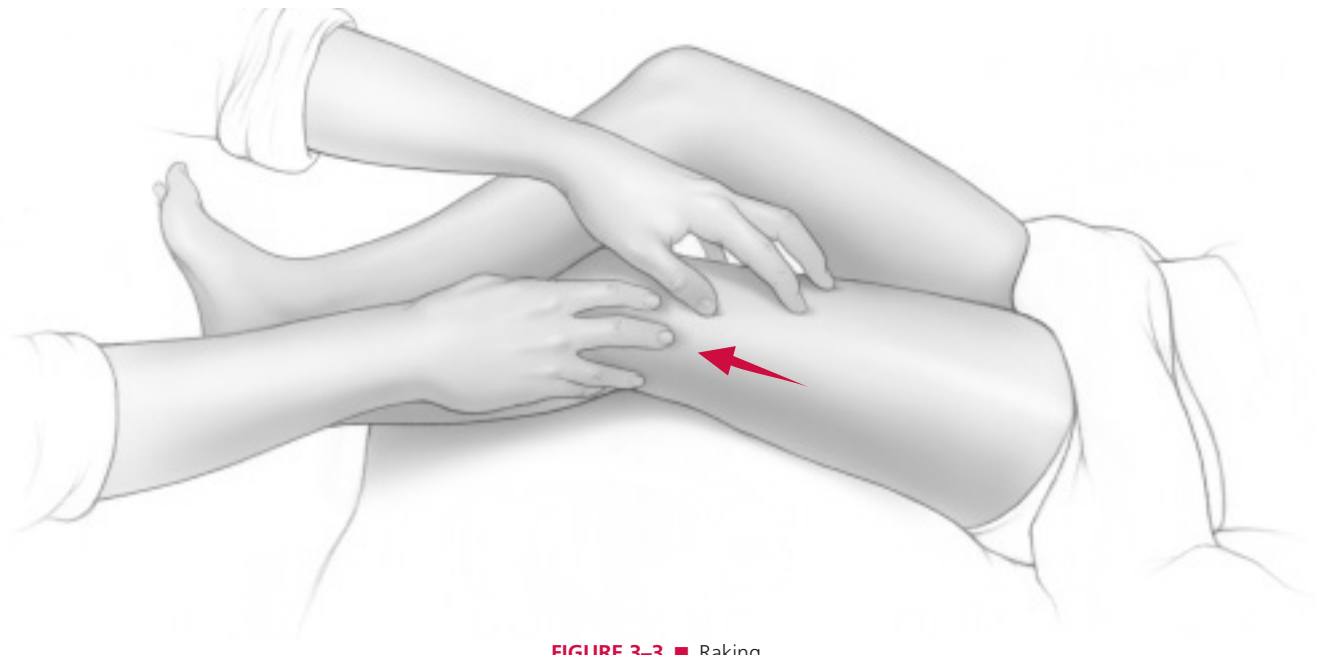


FIGURE 3-3 ■ Raking.

thumb (see Figure 3-5). Let these small pushes or strokes overlap slightly and move in the direction specified for each part of the body. Use medium to firm pressure.

Friction

Friction strokes are performed by placing the palms of your hands against the surface of the skin and rubbing briskly (see Figure 3-6). This gives a sensation of warmth to the area. In classic Swedish massage, both superficial and deep friction may be used; however,

pediatric massage typically calls for only superficial friction. In this book, it will only be used on the hands, feet, and chest.

Tapotement

Tapotement (from the French word for tapping) is a series of brisk, rapid blows applied with alternating hands that are parallel to each other. It is primarily used to stimulate nerve endings. It should always be done after the child's tissue is warmed with, at least, effleurage and, perhaps, other strokes as well.



FIGURE 3-4 ■ Kneading.



FIGURE 3-5 ■ Thumbstroking.



FIGURE 3-6 ■ Friction.

In pediatric massage, tapotement can provide additional sensory stimulation at the end of the massage on any part of the body. Most children enjoy tapotement if it is done in a light, playful way—during cupping of the chest, if the child is asked to exhale and make a loud noise, the resulting sound is often a source of great amusement. Do not use tapotement over kidneys, bony prominences, the popliteal or

antecubital areas, throat, breasts, or abdomen. The variations of tapotement include tapping, pincement, and cupping.

Tapping

Tapping consists of quick, light, alternating taps of your fingertips on a small portion of the child's body (see Figure 3-7).



FIGURE 3-7 ■ Tapping.



FIGURE 3-8 ■ Pincement.

Pincement

Pincement (from the French word for pinching) is when the skin is picked up or “pinched” lightly and rapidly with alternating hands, using the thumb and first two fingers of each hand (see Figure 3-8). Think of lifting the skin rather than pinching it.

Cupping

To perform cupping, rapidly alternate cupped-hand movements with both hands (see Figure 3-9).

This movement is not only used to stimulate nerve endings, but to break up congestion when a child has a chest cold, pneumonia, or cystic fibrosis. Use caution so that the child does not receive too much pressure or feel that he or she is being beaten.

PASSIVE RANGE OF MOTION

During passive range-of-motion exercises, you move each of the child’s joints through its full comfortable range of motion. The child remains totally passive and motion only occurs within the joint as a result of the outside force from the therapist. Range-of-motion exercises are done to maintain or increase joint motion, as well as to stretch other tissue that surrounds the joints. When they are not regularly moved through their full range of motion, by activity or by someone else helping them move, joints can lose their flexibility and even develop contractures. In addition, muscle tension, adhesions, and trigger points may decrease range of motion at a joint.

When to Use Passive Range-of-Motion Exercises

You can use passive range-of-motion exercises initially to evaluate a child’s joint flexibility. In addition to being useful for assessment, passive range-of-motion exercises are valuable for treatment. They are an excellent tool to help you pinpoint where children



FIGURE 3-9 ■ Cupping.

hold muscular tension. They also help maintain joint flexibility when children are immobilized by injury, illness, surgery, or paralysis. When children are not using all joints freely, they should have regular, passive range-of-motion exercises. For example, when a girl is using crutches to walk, she is not going to be swinging her arms back and forth as a child will normally do when walking, and her shoulder joints are going to be supporting part of her body weight in a way that they would probably never do otherwise. The girl is at risk of accumulating both extreme muscle tension and the loss of some range of motion in her shoulder joints. She would benefit from regular, passive range-of-motion exercises to help her maintain full range of motion in her shoulders and to release tension in the surrounding muscles.

It is important to understand that children have greater movement in most of their joints than adults do. A classic study, which compared the range of motion in an adult's joints and a child's joints, found that many pediatric joints had about 10% more movement than those of adults. The greatest differences between adult and pediatric joint movements were found in backward extension and outward rotation of the shoulder, radial deviation of the wrist, internal and external rotation of the hip, and plantar flexion of the ankle.¹

The range-of-motion exercises you will be learning in this chapter are not for the purpose of treating tightness or limitation of range caused by dysfunction in the joint itself. Instead, they will be used to:

- Help children learn to relax a specific area of the body by surrendering its weight to you. Many adults have a great deal of difficulty relaxing in this way. An extreme example of this is an adult who is supine on a treatment table with his or her head held stiffly, unaware that his or her muscles are contracted. Because this adult is truly unaware of the muscle tension, it may not be possible for him or her to receive some of the benefits of massage. For example, he or she may never be able to relax, have his or her neck muscles fully stretched, or to fully perform range-of-motion exercises. By teaching a young person to relax an area when it is moved by another person, you teach an important lesson that may prevent the type of chronic contraction described for adults.
- Help you pinpoint where a child holds muscular tension.
- Build the child's trust and acceptance of a different kind of touch, during which the child learns to be totally relaxed and passive.
- Increase the child's body awareness. Sensory nerve endings in the joints that respond to mechanical pressure (mechanoreceptors) are

responsible for much of an individual's balance, **proprioception**, and kinesthetic awareness. Range-of-motion exercises stimulate these receptors and help the child feel these sensations: the weight of the body part as the child lets you lift it; the feeling inside the joint as the bone ends are pushed together and apart; how large the body part is as it moves through space; and the stretching or the resistance to stretching of soft tissues around the joint, such as the muscles, tendons, fascia, and joint capsules. This resistance may be partially caused by muscle tension and/or adhesions.

How to Perform Passive Range-of-Motion Exercises

When integrated with massage strokes during a session, passive range-of-motion exercises are not only relaxing and therapeutic, they make a treatment more varied and interesting. Here is how to do them:

- Do these exercises in a playful fashion, singing as you do them or moving in time to a nursery rhyme. Children may find it uproariously funny to have their hands "accidentally" hit you in the face during a movement of the shoulder joint!
- Each time you finish massaging a part of the body, do the range-of-motion exercises for that part. Do all the joint movements with the child in the supine position, except hip extension and knee flexion and extension, which need to be done in the prone position. Do each movement three times.
- Gently pick up the limb or body part, fully supporting its weight. Use a firm, comfortable grip. Use good body mechanics to prevent excessive reaching. Ask the child to let the body part rest in your hands and be heavy.
- Move the body part smoothly, slowly, and rhythmically. Jerky or fast movements can cause the child to tense the area.
- Avoid moving or forcing a body part beyond its existing range of motion. Muscle strain, pain, or injury could result.
- If the child tenses during the movement, stop temporarily while you ask the child to relax and let the body part rest in your hands. Should there be any pain associated with the movement, try it again but do not move the body part as far. If there is still pain, discontinue the motion.
- If the amount that the joint can move seems less than normal, move it even more slowly through its potential range; have the child relax whenever you find restrictions or if the child is tensing. Do not use force. Point of Interest Box 3-1 describes how to determine when a joint has reached the end of its normal range of motion.



CASE STUDY 3-1

Background

Joe Polk was born with arthrogryposis (definition, *condition of curved joints*) in 1998. A child with this condition has multiple limb contractures that are present at birth, often accompanied by hip dislocation, clubfoot, and muscular atrophy. Arthrogryposis is not inherited and its cause is unknown. One theory holds that arthrogryposis is caused by a virus contracted by the mother during pregnancy; the muscles are affected so that they do not develop properly, and the fetus does not move in utero. A child with this condition typically has severe joint restriction and deformities. Those afflicted with this disability have stiffness, varying degrees of difficulty with motion, and pain. Correction of clubfeet and hip and knee contractures usually begins soon after birth, with casts and/or range-of-motion exercises and, possibly, surgery. Some children with arthrogryposis may be able to walk and, if so, they may have varying musculoskeletal restrictions, including limitations in the various joints. Often they will require a wheelchair. When adults, their condition usually deteriorates as multiple contractures, stiffness, and pain increasingly limit their activity.²

When Joe Polk was born, his arms were straight and rigid, his wrists were fixed in full flexion, and his ankles were severely twisted (see Figure 3-10). His mother, a critical care nurse, remembers that his pulses were weak and the circulation in his hands was so poor that, when she would try to do even minor

movements with his wrists, his hands would turn purple. Trying to hold Joe during breast-feeding was like “trying to hold a bowling ball.” His feet were so contracted that they were twisted up to his stomach. His family was told that due to his condition, he would never use his hands and would need seven or more operations on his upper and lower extremities. This included surgery to remove his pectoralis major and implant it in place of his biceps, which would have fixed his arm in a flexed position; surgery on his feet to reset the bones in their proper position; and serial casting to correct his foot contractures.

Joe had foot surgery and serial casting on his feet, which involved having a new cast put on every week for 5 months; however, his parents were reluctant to have major surgery on his arms.

Treatment

Joe was fortunate to be born in a family in which his mother, Mary Polk, was a critical care nurse with special training in Swedish massage and reflexology. Joe was an alert and strong baby, but somewhat irritable as he was continually frustrated by not being able to move. Joe’s mother began on the day he was born to give him daily massages and range-of-motion exercises. She massaged Joe while he was in her lap, using Swedish massage strokes on his entire body. She used firm pressure, especially around his joints, and also did foot reflexology. She did passive range-of-motion exercises and stretched his contracted tis-



A



B

FIGURE 3-10 ■ Joe Polk. A, 3 days old; B, age 4.



CASE STUDY 3-1 (Continued)

sue whenever possible. Mary observed that Joe's tissue softened after massage and that he also seemed mentally relaxed and far more bonded to his mother. She also frequently worked with Joe in a bathtub, doing range-of-motion exercises while he floated in the warm water. Joe's first set of casts to correct his clubfeet were put on when he was 3 days old, and a new cast was put on every week for many weeks. Mary knew that although the casting was necessary, Joe would not be receiving any sensory stimulation or movement when his feet were in the casts. She was so concerned about the effects of immobilization on Joe's feet that she purchased a cast cutter, and each week, she removed his casts the night before they were to be recast; this allowed her to bathe his legs and do massage and range-of-motion exercises on his feet and ankles before the casts were redone the next day. Joe also received a great deal of craniosacral therapy when he was 4 to 6 months old, which focused on dural tube mobilization to free his spinal cord, balance of his reticular system, and release of specific cranial restrictions. During some sessions, he released a great deal of anger and frustration, with intense screaming. His joint mobility continued to increase slowly but steadily. Joe continues to receive regular massage from his mother today at age 3, but not the intensive type of therapy he received in his first year.

Response

During his therapies, Joe gained range of motion in all of his joints. At age 4, Joe now looks completely normal. He no longer needs orthopedic shoes, his feet have no deformities, and his ankle range of motion is normal. He can dress and feed himself, dive off a diving board and swim underwater, ride a tricycle, climb a ladder, and use his hands to color and cut with scissors. He has slightly limited range of motion in his elbow joints and limited extension in one wrist, but as he continues to be highly active, his joint range of motion is expected to improve even more, and his doctors no longer feel further surgery will be necessary (Polk M, personal communication, September 2002).

Discussion Questions

1. What tissue was affected by Joe's arthrogryposis?
2. What symptoms did Joe have as a result of his arthrogryposis?
3. What therapeutic modalities were used with Joe, including massage therapy?
4. How did Joe show that the arthrogryposis had affected him psychologically, as well as physically?

Head and Neck

Movements are shown in Figure 3-11.

1. Place the fingers at the base of the child's skull, with the thumbs at the side of the head and slightly above the ears. Slowly and gently push the head forward until resistance is felt or the chin touches the chest. Slowly lower the head to its resting position. This flexes the neck (see Figure 3-11A).
2. Repeat Step 1, but as you bring the head back to the resting position, let it gently fall back on your fingers so that the child's chin is pointing toward the ceiling. This extends the neck (see Figure 3-11B).
3. Place one hand behind the child's head and the other hand under the chin. Elevate and support the head at a 45° angle to the child's body. Slowly turn the head to one side until a slight resistance is felt. Turn the head to the other side until a slight resistance is felt. Avoid flexing or extending the neck as you turn the child's head. This rotates the cervical spine (see Figure 3-11C).
4. With the palms on either side of the face, move the head to one side until resistance is encoun-

tered or until the ear touches the top of the shoulder. Repeat on the other side. This laterally flexes the cervical spine (see Figure 3-11D).

Upper Extremity—Shoulder, Elbow, Wrist, and Hand

Movements are shown in Figure 3-12.

Shoulder and Elbow

Grasp the arm with one hand beneath the elbow and one hand beneath the wrist, unless otherwise indicated.

1. Move the arm up to the ceiling and toward the head. This flexes, externally rotates, and extends the shoulder (see Figure 3-12A).
2. Move the arm away from the body and toward the child's head until the hand is touching the top of the head. This abducts and externally rotates the shoulder (see Figure 3-12B).
3. Move the arm across midline until the hand touches the child's other shoulder. This adducts the shoulder (see Figure 3-12C).
4. Place the arm out to the side at shoulder level (90° abduction) and bend the elbow so that the hand is pointing straight up. Move the forearm



POINT OF INTEREST BOX 3-1

How to Determine When a Joint Has Reached the End of Its Normal Range of Motion

When performing passive range-of-motion exercises, it is important to know when you have reached the end of a joint's normal range of motion. If you are not aware of how the joint feels at that point, you might force it too far and cause an injury. There is a characteristic quality to the resistance or limitation encountered at the end of the normal range of motion, known as the end-feel. Once you learn what the end-feel is like, you will know when to stop when the joint has reached its maximum range. To learn how to identify end-feel, when you reach the end of what feels like unrestricted motion, apply a gentle overpressure and notice how the joint feels at that end point.¹ When the joint has moved as far as it normally can, you will feel one of the following end-feels:

1. Bony end-feel. When two bones come together, it stops further motion at a joint. The resistance felt is hard and abrupt and motion comes to a full stop. Full elbow extension has this type of end-feel.
2. Capsular end-feel. The joint capsule and its surrounding soft tissue (but not muscles) limit the range of motion at the joint. The quality of the resistance felt is firm but not hard; there is a slight "give" to the movement, similar to when stretching a piece of leather. Full medial rotation of the hip has this end-feel.
3. Muscular end-feel. The length of the muscles limits the range of motion at a joint. The quality of the resistance felt is firm, although not as firm as the capsular end-feel, and somewhat springy. When the child is in a supine position with the leg lifted in the air and the knee is flexed and then extended, this is the muscular end-feel; the limitation in knee extension is from the muscles at the back of the knee.
4. Soft-tissue end-feel. Soft tissue limits the range of motion. The quality of the resistance is mushy or soft. When the child is supine and the knee is fully flexed and the posterior thigh stops the calf, the knee can flex no further. This is the soft-tissue end-feel.¹ The child's response to passive movement provides information about non-contractile elements such as ligaments and fasciae.

¹Reese N, Bandy W: *Joint Range of Motion and Muscle Length Testing*. Philadelphia: W.B. Saunders, 2002, p 27-29, 394

down until the palm touches the therapy table. This rotates the shoulder externally (see Figure 3-12D).

5. Move the forearm back until the back of the hand touches the therapy table, close to the child's head. This rotates the shoulder internally (see Figure 3-12E).
6. Bend the elbow until the fingers touch the chin, and then straighten the arm out. This flexes and extends the elbow (see Figure 3-12F).
7. Grasp the child's arm, as for a handshake, and turn the palm up and down; make sure that only the forearm moves and not the shoulder. This pronates and supinates the forearm (see Figure 3-12G).

Wrist and Hand Movements

Flex the child's arm at the elbow until the forearm is at a right angle to the therapy table. Support the wrist joint with one hand and, with the other hand, manipulate the joint and the fingers.

1. Bend the wrist backward and, at the same time, flex the fingers so that they touch the palm. This hyperextends the wrist and flexes the fingers. Now, bend the wrist backward and extend the fingers. This hyperextends the wrist and the fingers (Figure 3-12H).
2. Bend the wrist forward and extend the fingers. This flexes the wrist and extends the fingers (Figure 3-12I).

Lower Extremity—Hip, Knee, Ankle, and Foot Movements are shown in Figure 3-13.

Hip and Knee

1. Lift the leg by grasping the child's foot with one hand and the knee with the other hand. Bend the knee and flex it toward the chest until resistance is felt. This flexes the hip and the knee (see Figure 3-13A).
2. Support the child's knee underneath with one hand and support the ankle with the other hand; let the knee fall toward the outside as far as the child's tissue will allow. Now move the foot up toward the ceiling and then down in the opposite direction. This rotates the hip externally and internally. Note that careful draping is necessary to prevent the child's genital area from being exposed; even with careful draping, the child may feel exposed or vulnerable with the hip in this position. Explain what you are going to do before you attempt this hip rotation, and carefully check that the child is comfortable. If you have any doubt, omit this joint movement and Step 3 (see Figure 3-13B).
3. Continue to support the leg in the same way. Flex the hip by repeating Step 1 above, then

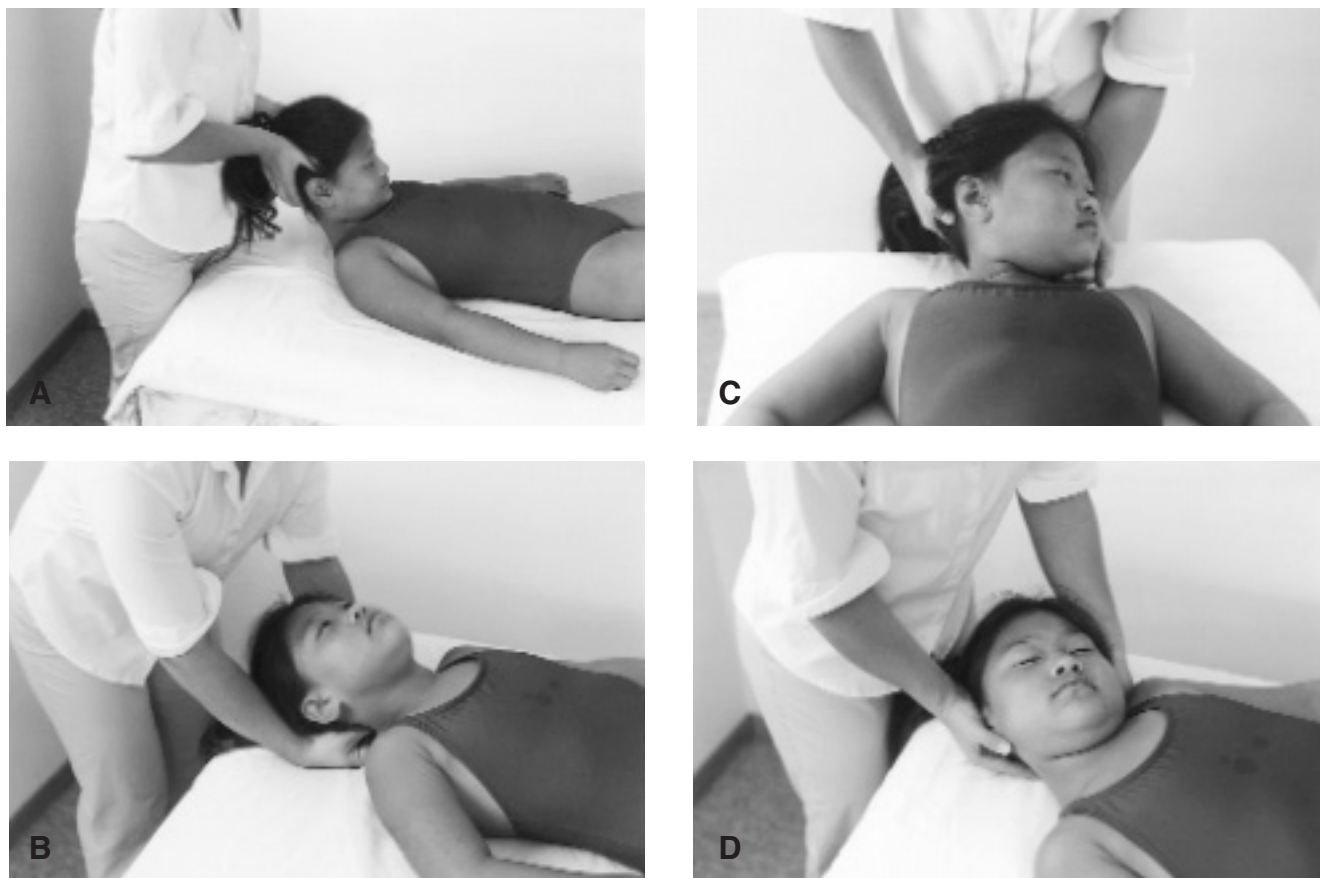


FIGURE 3-11 ■ A-D, Passive Range-of-Motion Exercises for the Head and Neck.

- bring the thigh medially across the body toward the other side, down toward the outside, and laterally. This flexes, adducts, and abducts the hip (see Figure 3-13C).
4. With the child lying prone, place one hand on the hip to stabilize it and, with the other hand, lift the leg at the knee. Move the leg backward from the hip joint, then medially, then back toward the table, then laterally. This extends the hip (see Figure 3-13D).
 5. With the child lying prone, lift the ankle and bring it toward the buttock until you feel resistance. Straighten the lower leg as you lay it back in the original position. This flexes and extends the knee (see Figure 3-13E).

Ankle and Foot

1. Grasp the foot with one hand and the ankle with your other hand. Make the entire foot rotate at the ankle. Rotate clockwise and counterclockwise. The ankle is a hinge joint and will not make a true circular movement; however, in trying to rotate it, you will be dorsiflexing, inverting, plantar flexing, and everting the

foot. This may be done with the child either prone or supine (see Figure 3-13F).

2. Grasp the top part of the toes of one foot using the thumbs and fingers. Rotate clockwise and counterclockwise (Figure 3-13G).

Adapted from: Kozier B, Erb G, Berman A, Snyder S: *Fundamentals of Nursing*. Upper Saddle River, NJ: Prentice-Hall, 2000.³

SENSORY STIMULATION OF THE SKIN

The various nerves in the skin that sense light pressure, deep pressure, and temperature change are stimulated by new and varied types of touch on the skin (see Figure 3-14).

These can be provided through the use of massage oils or lotions, textured massage tools, coarse towels, fake fur, different types of hairbrushes, hot packs, ice massage, ice packs, different temperatures of water, soap lather, and Epsom salts. By exposing the child to them as part of the massage experience, you not only decrease his fear of touch, you can also enrich the sensory experience of the child, reinforce body boundaries, and help build a more complete and accurate body image.



FIGURE 3-12 ■ A-I, Passive Range-of-Motion Exercises for the Upper Extremity.

BALL MASSAGE

Ball massage is a specific technique that combines continuous motion and compression of tissue; it can be done from one end to the other of the extremities, torso, abdomen, or back (see Figure 3-15). Its effect can be superficial or deep, and fast or slow, and stimulating or soothing, depending on the type, size, texture, and density of the ball and on how it is moved. By varying the texture and weight of the ball and the amount of pressure against the child's body, ball massage can give additional feedback about the skin, muscle and other soft tissue, and bone and about how the different layers of tissue relate to each other. Especially when used with deep pressure, ball massage releases tension in the child's muscles and stimulates the skin. As discussed in Chapter 2, keep a variety of appealing balls on hand for the child to choose from, including rubber balls; tennis balls; balls that

are large, small, or spiked; and balls that make noise (such as balls with a bell inside or ones that squeak). Do not use hard wooden balls. Let the child pick a ball and then be playful with it. Children will enjoy a ball that has a novel color or texture, a ball that makes noise, or a ball that you roll on their body in rhythm to a rhyme or song; for example, a ball may be rolled slowly straight down the back in one smooth motion or it may be rolled gradually down the back, moving in tiny circles all the way. No exact directions are given for ball massage, but remember to thoroughly cover any area that is being massaged.

RELAXATION TECHNIQUES

Basic Relaxation Sequence

Each time you begin to massage a new part of a child's body, practice this simple relaxation sequence.



FIGURE 3-13 ■ A-G, Passive Range-of-Motion Exercises for the Lower Extremity.



FIGURE 3-14 ■ Washing the back provides a variety of different skin sensations, including those of temperature, texture, and pressure.

It is simple, takes a short time, and yields profound results, greatly enhancing the relaxing effect of the massage and helping the child to learn to consciously relax.

Gently lay your hands on the part of the body you will be massaging. For massage of the head and shoulders, lay your palms gently on either side of the head (Figure 3-1). For massage of the arm, rest the child's hand gently between your palms. Both you and the child should take a few deep, comfortable breaths. As you exhale, consciously relax. Drop your shoulders, allow your face to soften, and relax your hands. If you feel tension anywhere in your body, relax that area as you exhale. Use the following suggestions to help the child relax while he or she is exhaling:

- Feel your stomach get nice and soft.
- Let your shoulders get heavy and melt into the table.
- Let your muscles melt like butter in the hot sun.
- Pretend you are as loose as a Raggedy Ann doll (you could use a doll to show the child what you mean).
- Let your hands hang loose.
- Let your whole body relax and sink into the table.

Use positive phrases, such as “relax more and more,” rather than negative ones, such as “don't tense up.” If you see the child holding tension, gently remind him to relax. Be sure to give the child lots of positive reinforcement whenever you see even small signs of relaxation.

Advanced Relaxation Sequence

This advanced relaxation technique is a method called “progressive relaxation,” which was invented by physiologist Edmund Jacobson in the early 1900s. It consists of systematic tensing and releasing of various

muscle groups throughout the body, while, at the same time, paying close attention to the sensations this creates. This method can teach a child how to relax while simultaneously increasing body awareness. It has been used for decades with children for medical and emotional problems, including general tension, insomnia, test anxiety, hyperactivity, tactile defensiveness, migraine headaches, depression, and phobias (Anneberg L: *A study of the different relaxation techniques in tactile deficient and tactile defensive children*. Master's thesis, Lawrence, KS: University of Kansas, 1973).⁴⁻¹¹

The author has adapted Jacobson's method for use during pediatric massage. In this modified version, you will ask the child to tense and relax different muscle groups against your hands while you offer mild resistance. Your hand placement helps the child understand precisely where to contract the muscles. Suggest that the child tense the muscles in an exaggerated way, so that he or she can notice the contrast between how the muscle feels when it is tense and how it feels when it is relaxed. Because all the child needs to do is follow a simple instruction, such as “push up against my hands,” the method can be used with even very young children. The entire sequence should be done at the beginning of a massage session and should take no more than 5 minutes. It is ideal to use with a child who seems to be lacking body awareness or with a child who is very tense upon arriving for a session. It may be used with a child who is concerned about modesty as well, as it can be done with the child fully clothed. Parents may be taught to do this sequence with their child before bed if he or she has insomnia.

1. Ask the child to lay supine on the floor or treatment table.
2. Place your hands gently on the area you will be asking the child to tense. Checklist Box 3-1



FIGURE 3-15 ■ Ball Massage.

- gives a sample sequence. Then ask the child to push against your hands and offer mild resistance (push back gently).
3. Remind the child to tense only the specific area you have mentioned. Observe the child to see if other parts of the body are being tensed. If so, ask the child to relax everywhere except the area that is supposed to be tensed; for example, if you are asking a child to take a deep breath and tighten his chest, and you observe that he is clenching his hands, remind him to relax them.
 4. Remind the child to tense hard.
 5. Hold each contraction for 2 seconds for a small child and up to 5 seconds for a teenager. Remind the child to notice how tight the area feels. Then, instruct the child to relax and enjoy the pleasant feeling as the muscles let go. When you see him or her following the instructions, give lots of positive reinforcement. After a pause of about 10 seconds, go to the next area of the body. The pause is important; by allow-

ing the child a “rest time,” the subtle changes that occur as the muscles relax can be felt. Otherwise, with too many contractions in too short of a time, the child may focus on the contractions alone.

ADAPTING MESSAGE TO THE INDIVIDUAL CHILD

Because every child is a unique individual, you may need to alter your massage treatment for each individual child, rather than try to do each massage as outlined here. Children and their parents can generally tell you what best suits them. Here are some general guidelines:

Attention Span

Children are truly individuals when it comes to how long they will lie quietly. Younger children usually have a shorter attention span, although this is not always true. Some toddlers will lie still for a full-body



CHECKLIST BOX 3-1

ADVANCED RELAXATION SEQUENCE (INSTRUCTIONS FOR THE CHILD ARE IN QUOTATIONS)

Tensing the Legs

- Hands on top of the lower legs: “Push up against my hands. Now let go all at once.”
- Hands underneath the lower legs: “Push down against my hands. Now let go all at once.”
- Hands on the outside of the lower legs: “Push out against my hands. Now let go all at once.”
- Hands on the inside of the knees: “Push in against my hands. Now let go all at once.”

Tensing Muscles Around the Pelvis

- Hands on top of the iliac crests: “Push up against my hands. Now let go all at once.”

Tensing the Abdomen

- Hands on top of the abdomen: “Push my hands away with your tummy. Now let go all at once.”

Tensing the Chest

- Hands on top of the chest: “Take a deep breath, hold it, and push up against my hands. Now let go all at once.”

Tensing the Arm and Shoulder Muscles

- Hands on the top of each forearm: “Push up against my hands. Now let go all at once.”
- Hands underneath each forearm: “Push down against my hands. Now let go all at once.”
- Hands on the outside of each forearm: “Push out against my hands. Now let go all at once.”
- Hands on the inside of each forearm: “Push in against my hands. Now let go all at once.”

Tensing the Shoulders

- Stand at the child’s head, and push down on both upper trapezius muscles: “Push up against my hands. Now let go all at once.”

Tensing the Neck Muscles

- Slip both palms underneath the head: “Now lift your head up just a tiny bit off the table. Keep holding up your head and feel how heavy it is.” When the child’s head is held up off the table, slip a small pillow underneath her head. “Now let go all at once.” She will drop her head on the pillow, and it will feel as if she is resting on a cloud.

Tensing the Muscles of the Face

- Slip both hands underneath the head, and hold gently: “Make a tight face. Wrinkle up your forehead, close your eyes tight, wrinkle your nose, stick out your tongue, and pucker your lips. Feel how tight a face you can make. Now let go all at once.”

Tensing the Entire Body

- Continue to hold both hands underneath the head: “Tighten up every thing we’ve tightened before.”
- Check to see that the child has tightened up from the feet to the head, including the face. Gently remind the child to tense any parts of the body that you see are still relaxed. When everything is gently tensed, ask the child to let go all at once. Now, as the child rests, ask him or her to say what feels different now.

massage, and some older children will be able to relax for only 5 minutes.

For those children who cannot seem to lie still, you can adapt your usual way of giving a massage. Here are some ideas that may be good solutions:

- Follow the child around and do massage as he or she plays.
- Ask the parent to distract children by playing with them while you continue to do the massage.
- Tell a story or sing during the massage. This may be successful with a small child.
- Give the child a toy or book to play with or look at.
- Change strokes frequently or use many different massage tools and different techniques for variety.
- Use warmth, such as microwave hot packs, steam packs, or warmed linens. One resourceful mother found that if she put a hot towel, fresh from the dryer, under her daughter, the girl would lie still much longer. Warm socks and put them on the child after a foot massage, or warm a T-shirt and have the child put it on after the upper body has been massaged.
- Use the advanced relaxation sequence during the massage session when the child becomes tired of laying still.

Amount of Pressure

This can vary from day to day, but most children usually prefer a certain type of pressure. Their preferences range from extremely light to very firm. Some children may ask for firmer pressure over very tight areas or lighter pressure over sore areas. You should always monitor nonverbal signals that indicate you are using too much pressure (such as flinching or grimacing), and check with the child often. Use phrases such as “Is this too hard?” or “Does it feel better if I go softer or lighter?”

Best Area to Massage

When in doubt, massage the back. Avoid any areas that the child does not like to have massaged or that cause discomfort. After some experience with the basic, full-body massage, children may begin to request massage of certain areas, for example, the back, for relaxation, insomnia, and shoulder tension; the stomach, for tension stomachaches; the face, for relaxation; the legs, for insomnia or growing pains; the neck, for tension headaches; and the feet, for fatigue or discomfort following vigorous exercise.

Which Strokes to Use

Use more of the strokes the child enjoys and use fewer or none of the strokes he or she doesn't enjoy. When in doubt, use superficial effleurage strokes,

which are generally well accepted. One mother found that her 11-year-old son would not tolerate anything but superficial effleurage and would giggle and flinch when she did anything else. So, every night, she used only superficial effleurage strokes and found that her son was able to relax and that she enjoyed giving him his massage. As he continued to benefit from his nightly massage, possibly, he would be able to enjoy other strokes in the future.

The Sequence of Strokes

It may be better to change the sequence of strokes for an individual child. For example, a child who comes in with a tension stomachache will be more relaxed for the rest of the massage if his or her abdomen is massaged at the beginning of the session. Or, you may wish to begin the massage in a different sequence; for example, if there is a reason to massage the back toward the end of the session, rather than the beginning.

FULL-BODY MASSAGE SEQUENCE

Before beginning a massage, children should be left alone with their parents to undress in private. (Teenagers may prefer to undress without parents present.) Let them know they should leave their underpants on and make sure that they know they will be carefully draped during their session. If there is any concern about disrobing, their wishes should be honored. While they are disrobing and getting under the drapes on the treatment table, you have the opportunity to wash your hands and get any supplies you need, from massage oil to toys. Now begin with the massage of the back.

BACK MASSAGE

Have the child lie face down. Place a small, rolled towel or pillow underneath the ankles. Sit on the side of the therapy table near her waistline. For a larger child, such as a teenager, you may stand at the head of the table, rather than sit, and do the back effleurage in reverse. Uncover the child's back and move her underwear down so that the posterior iliac crests are exposed but the gluteal cleft is still covered. (The following sequence is summarized in Checklist Box 3-2.)

1. Perform the basic relaxation sequence (see page 70) and passive touch on the lower back.
2. Apply oil or lotion.
3. Perform back effleurage (Figure 3-2). Begin with your hands just above the sacrum, parallel on either side of the spine, and with your fin-

- gertips pointing toward the head. Glide toward the head, moving up the middle of the back, in between the scapulae and up to the base of the neck. Now move your hands away from each other and glide along the top of the upper trapezius to the points of the shoulders, down the sides of the torso and hips to the bottom of the buttocks, and then return to the starting position, with your hands just above the sacrum. Each hand is actually describing a large oval shape. Repeat 10 times. Begin with superficial pressure. Pressure can be increased as the child's tissue is warmed and relaxed.
4. Rake the back (see Figure 3-16). Beginning at the top of the shoulders and using medium pressure, rake downward (toward the feet). On a small child, each raking stroke should be about 1 or 2 inches long; on a teenager, up to 5 or 6 inches long. Gradually move down the back from the shoulders to the top of the sacrum. Repeat the entire stroke three times.
 5. Perform back effleurage. Repeat three times.
 6. Knead the upper trapezius (see Figure 3-17). Knead the upper trapezius from the base of the neck to the tip of the shoulder. Use medium pressure. Knead each side for 30 seconds or longer.
 7. Perform back effleurage. Repeat three times.
 8. Thumbstroke between the scapulae (see Figure 3-18). The thoracic spinal erectors, the rhomboids and the middle trapezius muscles are located between the scapulae. Thumbstroking will warm and relax all these muscles. With the



FIGURE 3-16 ■ Raking the Back.

- thumbs, compress the tissue as you stroke toward the head. Press firmly, but do not cause pain; if the area hurts, lighten the pressure. Do for 1 minute or longer. Do not massage the spine.
9. Perform back effleurage. Repeat three times.
 10. Thumbstroke the lower back (see Figure 3-19). Beginning at the top of the sacrum, use both thumbs to outline each posterior iliac crest, one at a time. Use medium to firm pressure. Push away from yourself, first with the flat of one thumb and then with the other. Let these small pushes or strokes overlap slightly and gradually slide out along the bone, from the sacrum to the lateral edge of the iliac crest. Imagine that



CHECKLIST BOX 3-2 BACK MASSAGE

1. Basic relaxation sequence and passive touch.
2. Apply oil or lotion.
3. Back effleurage, 10 times.
4. Rake the back three times.
5. Back effleurage, three times.
6. Knead the upper trapezius, 1 minute.
7. Back effleurage, three times.
8. Thumbstroke between the scapula, 1 minute.
9. Back effleurage, three times.
10. Thumbstroke the lower back, 1 minute.
11. Back effleurage, three times.
12. Knead the buttocks.
13. Back effleurage, 10 times.
14. Skin stimulation stroke.
15. Ball rolling.
16. Basic relaxation sequence.



FIGURE 3-17 ■ Kneading the Upper Trapezius.



FIGURE 3-18 ■ Thumbstroking Between the Scapulae.

you can define its shape with the thumbs. Do one entire side and repeat on the other. Do once, slowly and thoroughly, taking approximately 1 minute.

11. Perform back effleurage. Repeat three times.
12. Knead the buttocks (see Figure 3-20). Knead the buttocks through the underwear from the

sacrum out to the side of the hip. Do one buttock, then the other. Use medium pressure. Do each buttock for 30 seconds or more.

13. Perform back effleurage. Do three times.
14. Perform a skin stimulation stroke. Choose one: cover the back with a pillowcase or sheet and massage the entire back with a textured massage tool or hairbrush; remove the sheet and do pincement or tapping on the entire back; gently rub massage oil off the entire back with a coarse washcloth or a piece of fake fur; or perform a salt glow of the entire back.
15. Perform ball rolling. Cover the back with a pillowcase or sheet, and roll any size ball (chosen by the child) up and down the length of the back for 1 minute. Do not press on her vertebrae. To increase awareness of the spine and release tension in the paravertebral muscles, a small, soft ball may be rolled in tiny circles on either side of the spine. Begin at T1 level, and slowly proceed down to about waist level. Use firm pressure adjusted to the child's tolerance.
16. End with the basic relaxation sequence.

LEG MASSAGE (BACK)

Sit at the foot of the table, near the outside of the child's foot. Small children may lay one entire leg

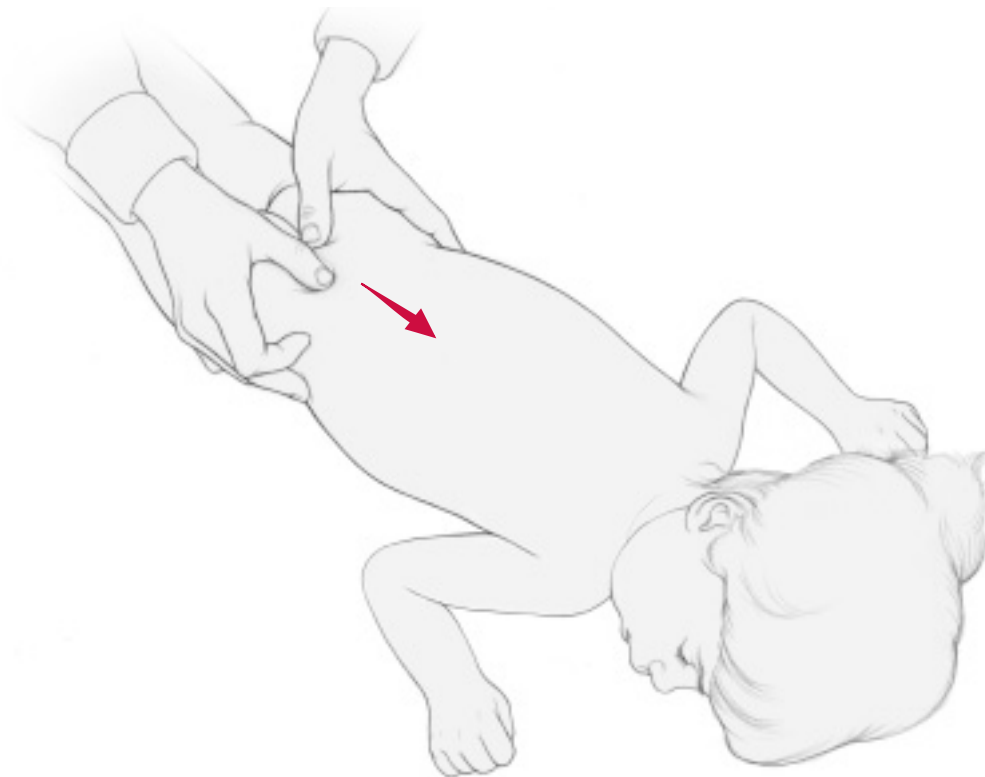


FIGURE 3-19 ■ Thumbstroking the Lower Back.



FIGURE 3-20 ■ Kneading the Buttocks.

across your lap. For better body mechanics with children who are almost adult-size, stand to the outside of the leg you will be massaging; do not stoop or stretch to cover the entire area. As the child will be wearing underpants, a few strokes will be done over the underwear. Although this decreases some of the benefits from gliding effleurage strokes, it is important for the child to have the protective boundary that underwear provides. The following sequence is summarized in Checklist Box 3-3.

1. Perform the basic relaxation sequence (see page 70) and passive touch on the foot or calf.
2. Apply oil or lotion.



CHECKLIST BOX 3-3 LEG MASSAGE (BACK)

1. Basic relaxation sequence and passive touch.
2. Apply oil or lotion.
3. Leg effleurage, 10 times.
4. Rake the back of the leg, 1 minute.
5. Leg effleurage, three times.
6. Thumbstroke the back of the leg, 1 minute.
7. Leg effleurage, three times.
8. Thumbstroke the sole of the foot, 1 minute.
9. Circle the anklebones six times.
10. Leg effleurage, 10 times.
11. Range-of-motion exercises for the hip and knee joints.
12. Skin stimulation stroke.
13. Ball rolling on the back of the leg and sole of the foot.
14. Basic relaxation sequence.

3. Perform leg effleurage (see Figure 3-21). Place the palms on either side of the ankle. With parallel fingertips pointing toward the head and hands, glide up to the top of the calf and continue up to the top of the thigh. This stroke mainly uses the fingertips on a small child and the entire hand (palm and fingertips) on a larger child. The inside hand covers the inside of the leg, and the outside hand covers the outside of the leg. Do not press on the back of the knee. When you reach the top of the leg, your outside hand will continue up to the top of the

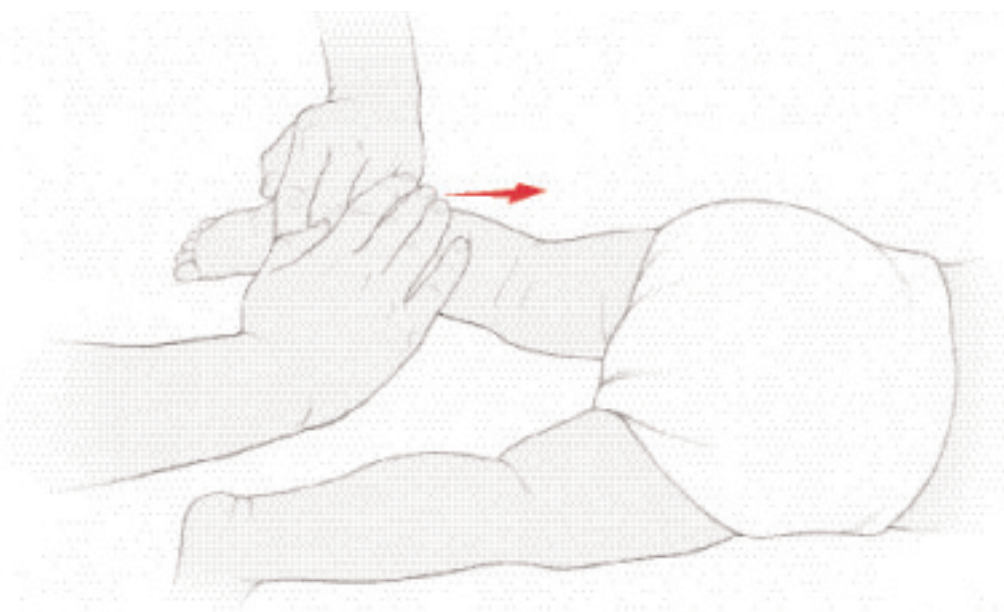


FIGURE 3-21 ■ Leg Effleurage.

- buttock and turn and glide back down the outside of the leg, as the inside hand glides down the inside of the leg. Although your outside hand will have to glide a longer distance than your inside hand, coordinate the hands so that they are parallel on the way down. When you reach the foot, glide down and gently stroke over the sole of the foot with the fingertips. Begin with superficial pressure. As the child's tissue becomes warmed and relaxed, deeper pressure may be used. Perform 10 times.
4. Rake the back of the leg (see Figure 3-22). For a small child, move to a sitting position opposite the back of the knee. For a nearly adult-size child, move to a standing position opposite the back of the knee. Begin raking strokes at the top of the buttock, stroking toward the feet and gradually work down to the back of the knee. On a small child, each raking stroke should be 1 or 2 inches long; on a teenager, up to 5 or 6 inches long. Cover the muscles of the inner thigh, top of the thigh, and outside of the thigh. Do not press on the back of the knee. Return to the original position at the foot of the table and continue raking from the top of the calf to the ankle. Do the entire stroke—raking from buttock to ankle—once, using medium pressure.
 5. Perform leg effleurage three times.
 6. Thumbstroke the back of the leg (see Figure 3-23). Begin just above the ankle, thumbstroking the calf muscles and gradually moving up the calf. When you reach the top of the calf, change your position to sitting opposite the knee. Do not press on the back of the knee. Continue thumbstroking from just above the

knee to the top of the thigh. Do the entire movement of thumbstroking from ankle to buttock once, using medium to firm pressure. Move back to sitting at the foot of the bed.

To perform a variation of this stroke, mentally divide the calf and thigh into three sections (inside, top, and outside), and thumbstroke each section separately.

7. Perform leg effleurage three times.
8. Thumbstroke the sole of the foot (see Figure 3-24). Begin at the base of the toes. Stroke away from you with many small pushes of the thumbs; work slowly and thoroughly up the sole of the foot to the heel. Imagine that the thumbs are dipped in ink and you want to completely ink the entire sole, with no areas left untouched. This is an area where firm pressure often feels good; ask the child what pressure feels best for her.
9. Circle the ankle bones (see Figure 3-25). Using the fingertips, slowly and gently circle around both ankle bones at the same time. Do six times.
10. Perform leg effleurage 10 times.
11. Perform passive range-of-motion exercises for the hip and knee. Extend the hip and flex and extend the knee (see page 66).
12. Skin stimulation stroke. Choose one:
 - Cover the back of the leg, including the buttock, with a pillowcase or sheet; massage it with a textured massage tool or a hairbrush.
 - Perform pincement or tapping on the entire back of the leg.
 - Gently rub the massage oil off of entire back of the leg with a coarse washcloth or a piece of fake fur.

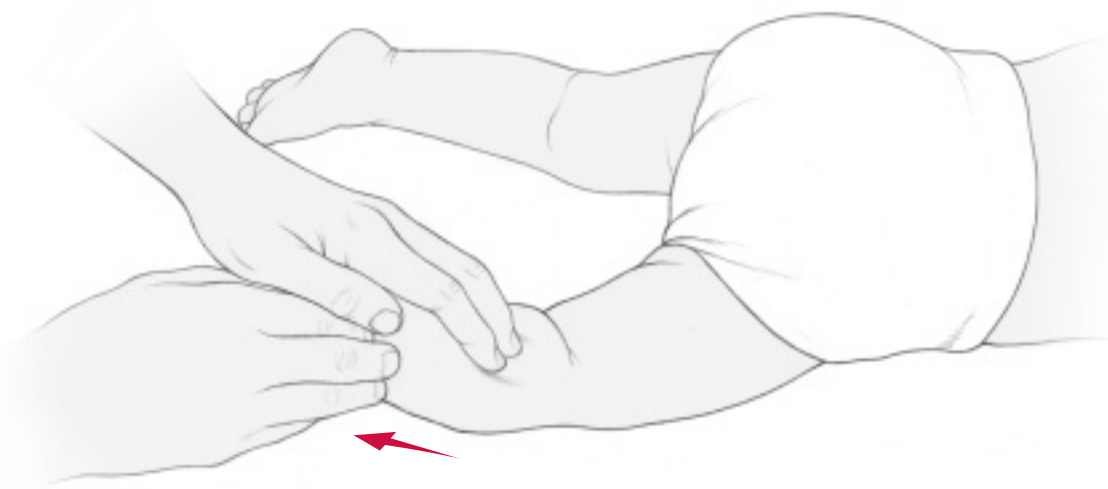


FIGURE 3-22 ■ Raking the Back of the Leg.

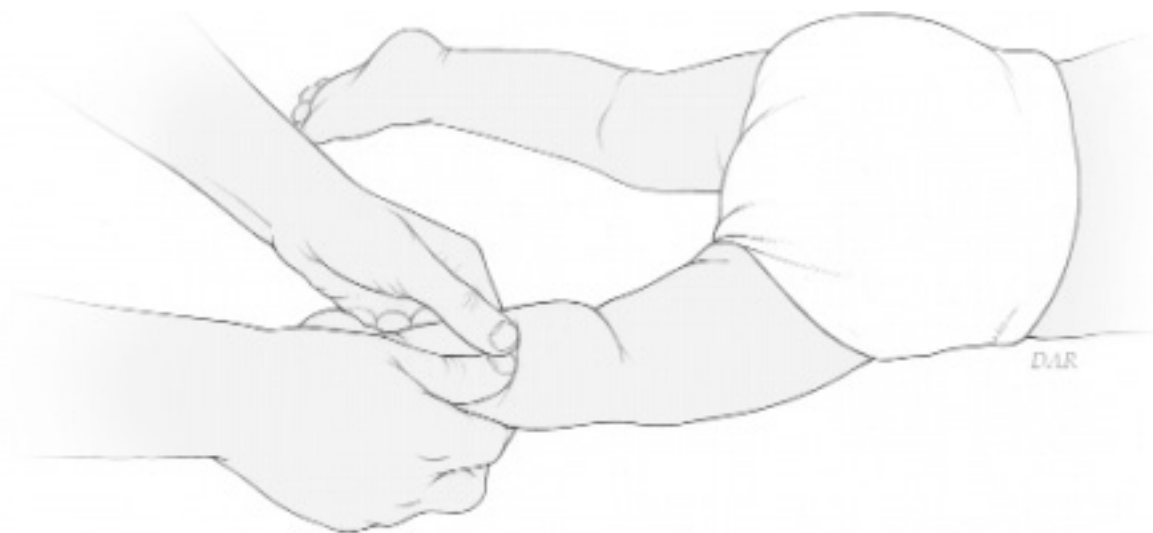


FIGURE 3-23 ■ Thumbstroking the Back of the Leg.

- Do a salt glow of the entire back of the leg and the sole of the foot (see page 93).
- 13. Perform ball rolling. Cover the back of the leg with a pillowcase or sheet, have the child choose a ball, and roll the ball from the buttock to the tips of the toes and back. Massage the sole of the foot and each toe with the ball, moving in tiny circles. Press each toe into the massage surface with firm pressure.
- 14. End with the basic relaxation sequence. Now move to the other leg, and repeat the same series of strokes.

HEAD, NECK, AND SHOULDER MASSAGE

The child should lie on her back with a rolled towel or pillow under her knees. Use this position for the rest of the full body massage. Sit at the head of the table. With a small child, you may wish to sit cross-legged on the floor. (The following sequence is summarized in Checklist Box 3-4.)



FIGURE 3-24 ■ Thumbstroking the Sole of the Foot.

1. Perform the basic relaxation sequence (see page 70) and passive touch.
2. Apply oil or lotion.
3. Perform shoulder and neck effleurage (see Figures 3-26 and 3-27). Use medium pressure. Begin the stroke at the medial ends of the clavicle. Place your hands palm down with the fingertips pointing toward each other. Your hands will be stroking along the clavicle, with your thumb above and your four fingers below the bone. Your hands move away from each other as they trace each collarbone from the medial ends of the clavicle out to the lateral ends and to the tips of the shoulders. When your hands reach the tips of the shoulders, slowly rotate



CHECKLIST BOX 3-4 **HEAD, NECK, AND SHOULDER MASSAGE**

1. Basic relaxation sequence and passive touch.
2. Apply oil or lotion.
3. Shoulder and neck effleurage, 10 times.
4. Diagonal neck stroke, 10 times.
5. Shoulder and neck effleurage, three times.
6. Scalp petrissage, 1 minute.
7. Shoulder and neck effleurage, three times.
8. Forehead and eye circles, six times.
9. Face effleurage, six times.
10. Cheek petrissage, 30 seconds.
11. Shoulder and neck effleurage, 10 times.
12. Neck range-of-motion exercises.
13. Skin stimulation stroke.
14. Basic relaxation sequence.



FIGURE 3-25 ■ Circle the Ankle Bones.

them so that the fingertips are underneath the shoulders. Glide along the top of the upper trapezius back to the neck, up the back of the neck, under the head and off. Perform 10 times.

4. Perform diagonal neck stroke (see Figure 3-28). To begin, turn the left hand palm up. Slide it under the neck to the right shoulder. Now pull this hand (the left) diagonally from the right shoulder across the neck and finish below the left ear. Switch hands and do the same stroke; the right hand will move diagonally from the left shoulder across the neck and finish below the right ear. Imagine that you are drawing an X on the back of the neck with the fingertips. This diagonal stroke across the neck allows you to combine cross-fiber stroking with a gentle stretching along the many layers of muscle fibers in this area. Curl the fingers as you slide and use medium pressure with the fingertips. Encourage the child to relax her neck and allow the stroke to move her head from side to side. If she is not relaxing her neck muscles, her head will remain in the same position during the stroke. Perform 10 times.
5. Perform shoulder and neck effleurage three times.
6. Perform scalp petrissage (see Figure 3-29). Slip your hands under the child's head, then cradle it by letting the back of her head rest on your palms. Begin at the base of her scalp and move your fingertips in slow, small circles. Feel the shapes of the bones underneath the scalp, and

notice the mobility and level of tension in the tissue of the scalp. Tension in the face, eyes, or neck (such as in the posterior cervical and sternocleidomastoid muscles) may initiate trigger points in the scalp muscles, and injuries to the head may also cause tension in the tissue of the scalp.¹² Gradually perform petrissage up the back of the head. When your hands begin to be uncomfortable in this position, flip them around so that your palms are down and continue petrissage up to the forehead. The temples and the area above the ears should be massaged, as well as the sides of the head. Use light to medium pressure, depending upon the child's comfort level. Massage the scalp for 1 minute.



FIGURE 3-26 ■ Shoulder and Neck Effleurage. Your hands are in the starting position.

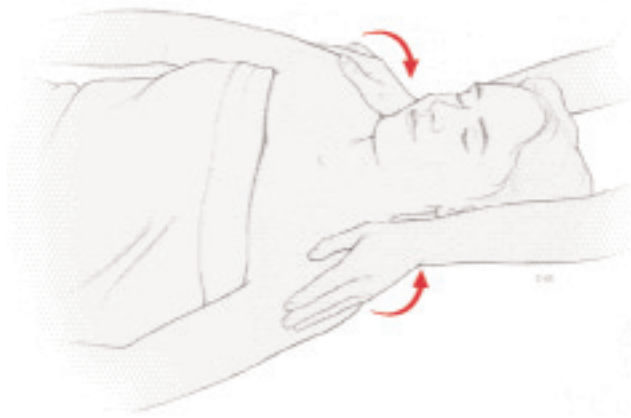


FIGURE 3-27 ■ Shoulder and Neck Effleurage. Your hands have reached the tips of the shoulders and are ready to rotate around them and glide up the upper trapezius to the neck.

7. Perform shoulder and neck effleurage three times.
8. Circle the forehead and eyes (see Figures 3-30 and 3-31). Place both hands palm down on the forehead with your fingertips pointing toward each other. (For a small child, you may have room for only the fingertips.) Slowly and gently rake from the middle of the forehead out to the temples. Make small circles with the fingertips on both temples simultaneously; then, using the index fingers, glide smoothly under the eyes up the sides of the nose and back to the forehead. Use light pressure when gliding in one smooth, flowing stroke. Repeat six times.
9. Perform face effleurage (see Figures 3-32 and 3-33). Use light pressure. Begin with the thumbs touching under the nose, index fingers touching below the lower lip, and the last three fingers curled below the tip of the chin. Stroke from the center of the face out toward the side of the face. The fingers will simultaneously outline the cheekbones, lips, and jawbone. When the fingertips reach the sides of the face, rotate your hands and let the fingertips slide up in front of the ear, over the temples, and up to the middle of the forehead. Glide the index fingers down the bridge of the nose to the chin, and begin again. With practice, this stroke can be done smoothly and continuously and has a very calming effect. Repeat six times.
10. Perform cheek petrissage. Using the fingertips, make small circles under the cheekbones (zygomatic arches) and on the cheeks. You are massaging the masseter muscle, one of the most common muscles in the entire body to harbor trigger points. Even infants may carry considerable tension in this area because of almost constant suck-

ing, chewing, and mouthing of objects. Dental pain or injury can initiate tension in the masseter, even in small children. By adulthood, unfortunately, many adults have substantial knots in this muscle. Perform petrissage gently, slowly, and thoroughly. Continue for 30 seconds or more.

11. Perform shoulder and neck effleurage 10 times.
12. Perform passive range-of-motion exercises for the neck (these include flexion, extension, rotation, and lateral flexion of the cervical spine; see page 67).
13. Perform a skin stimulation stroke. Choose one:
 - Gentle tapping of the entire face with the fingertips, taking care to avoid the eyes.
 - Gently wipe massage oil off the face with a washcloth. The cloth may be wrung out in warm water on a cool day or in cold water on a hot day.
14. End with the basic relaxation sequence.

CHEST AND ABDOMEN MASSAGE

Stand at the head of the therapy table. The following sequence is summarized in Checklist Box 3-5.

1. Perform the basic relaxation sequence (see page 70) and passive touch on the top of the shoulders.
2. Apply oil or lotion.
3. Perform chest and abdomen effleurage (see Figure 3-34). Place your hands on the chest, just below where the collarbones meet. Point the fingertips toward the feet. With hands parallel, glide down the center of the chest to the lower part of the abdomen. Here, move your

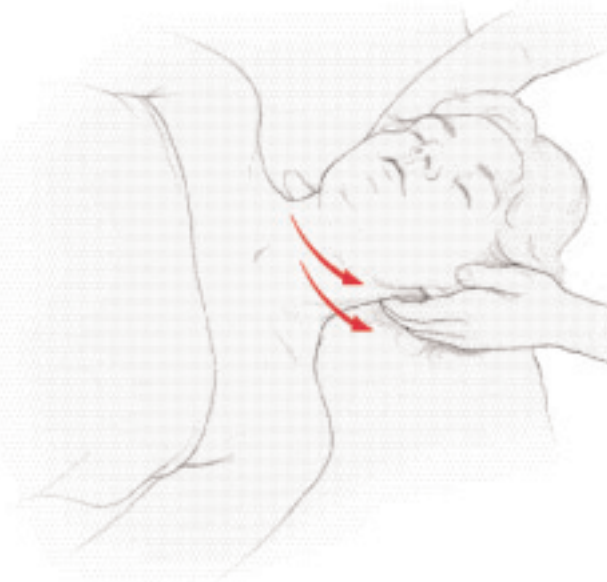


FIGURE 3-28 ■ Diagonal Neck Stroke.



FIGURE 3-29 ■ Petrissage of the Scalp.

hands away from each other to the side and glide over the anterior iliac crests, up the lateral aspect of the hips and torso, onto the upper chest, and back to the starting position. Use gentle pressure, gradually increasing the pressure as the child's tissue becomes warmer and more relaxed. Repeat 10 times.

Be careful to preserve the child's modesty and respect his right to refuse chest massage. Modesty is not usually a concern for very small children but, with older children, you should

always obtain their permission before the chest area is massaged. Although this is not usually a concern for boys, it is still wise to ask their permission first. The breasts and nipples should never be massaged unless you, the child, and the child's parent have agreed that there is a specific therapeutic purpose for doing so.

- Prepare the child before you remove the drape covering the torso and abdomen. For example, you might say, "I'm going to uncover your chest and stomach now. Is that okay



FIGURE 3-30 ■ Forehead and Eye Circles. The fingertips are in the starting position.

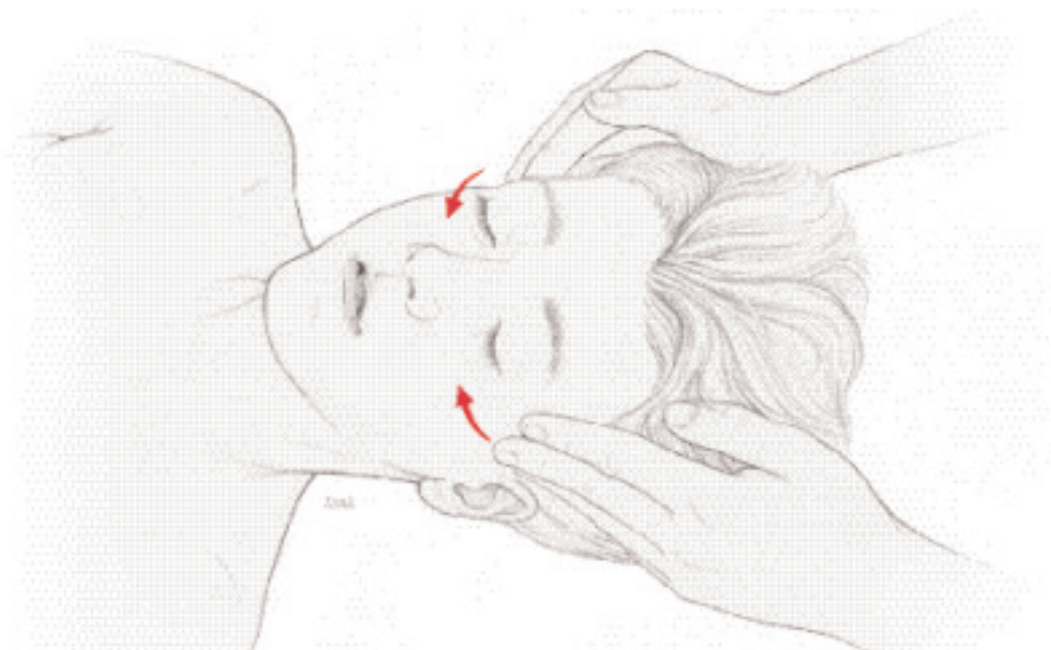


FIGURE 3-31 ■ Forehead and Eye Circles. The fingertips have reached the temples and are ready to glide under the eyes.

with you? And how do you feel about me massaging your chest?” If the child indicates any concerns, drape the breast area and massage only the abdomen.

- A powerful way to help the child experience the connectedness of his upper and lower body is to combine this stroke with the last part of the shoulder and neck effleurage stroke. Instead of returning to the starting position on the chest, as your hands move up the sides of the hips and torso, let them glide

over the tips of the shoulder, along the upper trapezius, under the back of the neck, under the head, and off.

4. Perform chest friction (see Figure 3-35). Place your hands as you would for the beginning of the chest and abdomen effleurage. Then glide just a few inches down the center of the chest (over the sternum) with your right hand. Return the right hand to the starting position and glide a few inches over the sternum with your left hand; return the left hand to the



FIGURE 3-32 ■ Face Effleurage. The fingers are simultaneously outlining the cheekbone, lips, and jawbone.

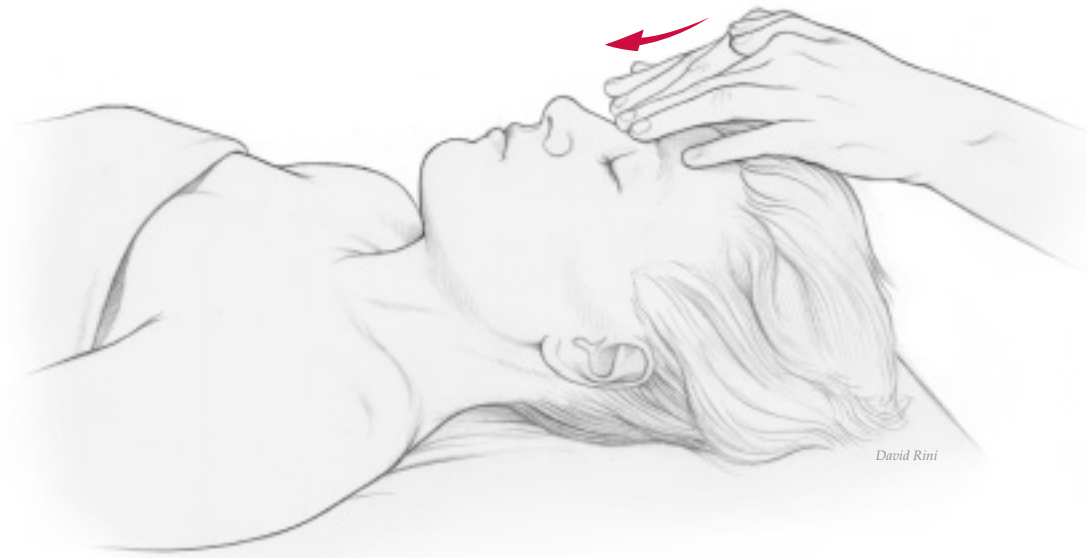


FIGURE 3-33 ■ Face Effleurage. The fingers have come up the side of the face to the middle of the forehead, and are ready to glide down the center of the face to the chin.

starting position and glide a few inches with your right hand. If you are working with a girl, be careful that the stroke stays over the sternum and that the breast area is not massaged. Continue alternating your hands, moving briskly. The size of the child's chest will determine how far each stroke can go; try to cover the area from the sternal notch to the bottom of the sternum, but do not press on the xiphoid process. Keep your hands soft so that they glide smoothly over the ribs; use gentle pressure. Continue for about 30 seconds. As with any friction stroke, your hands and the

child's tissue will soon feel dramatically warmer.

5. Perform chest and abdomen effleurage three times. Now move from the head of the table to stand on the right side of the table beside the right hipbone.
6. Perform abdominal effleurage (see Figure 3-36). The abdomen is often an especially vulnerable area. Physically, the internal organs of the abdomen lack bony protection, as compared with the heart, lungs, or pelvic organs, which are surrounded by bone. This may be the cause of the extra vulnerability many adults and children feel in this area. Be especially gentle when you first touch the abdomen. If the child has any history of abuse or simply seems unhappy about this area being massaged, do not proceed without specific consent. Begin by slowly making contact using the palm of your right hand (the hand closest to the abdomen). Rest it gently on the abdomen for a few moments to help the child become accustomed to touch. Make clockwise circles with your palm, covering the entire abdomen. After a few circles, include your left hand; the left makes clockwise half-circles on the top half of the abdomen, while your right hand makes the bottom half of its circle. Then take your left hand off the abdomen until your right hand completes the top half of its circle and returns to the bottom half of its circle. Use gentle pressure. Repeat 10 times. If the child is ticklish, you may try covering the abdominal



CHECKLIST BOX 3-5
CHEST AND STOMACH MASSAGE

1. Basic relaxation sequence and passive touch on the tops of the shoulders.
2. Apply oil or lotion.
3. Chest and abdomen effleurage, 10 times.
4. Chest friction, 30 seconds.
5. Chest and abdomen effleurage, three times.
6. Abdominal effleurage, 10 times.
7. Knead the abdomen, 1 minute.
8. Chest and abdomen effleurage, 10 times.
9. Skin stimulation stroke.
10. Basic relaxation sequence.



FIGURE 3-34 ■ Chest and Abdomen Effleurage.

area with a sheet and gently stroking through it; this may decrease the amount of skin stimulation enough to stop the ticklishness.

- For a small child, you may not be able to fit your entire palm on the abdomen and may need to glide more with your fingertips. Even so, remember that this effleurage stroke should be performed as smoothly as possible; do not poke or use direct pressure on the abdomen. Also, do not touch or put any pressure on the xyphoid process.
7. Knead the abdomen (see Figure 3-37). Reach across the abdomen and begin above the left iliac crest, kneading the abdomen. Knead across the abdomen, ending above the right iliac crest. Continue for about 1 minute. Many children are not fleshy in this area and knead-



FIGURE 3-36 ■ Abdominal Effleurage.

ing can be a challenge—there is just not a great deal of tissue to grasp.

8. Perform chest and abdomen effleurage. Return to the original position, standing at the head of the table, and repeat the chest and abdomen effleurage 10 times.
9. Skin stimulation stroke. Choose one:
 - Cover the chest and abdomen with a pillowcase or sheet and massage gently with a textured massage tool or soft hairbrush. This



FIGURE 3-35 ■ Chest Friction.



FIGURE 3-37 ■ Kneading the Abdomen.

may cause tickles, which some children will enjoy and some will not. Ask, "Do you want me to stop?" If the child cannot tell you, err on the side of caution and skip this stroke.

- Wipe massage oil or lotion off with a washcloth.
- Use a prewarmed towel that is large enough to cover the entire torso and abdomen. Cover the entire area with the towel and perform one or two effleurages over the towel to bring it in contact with the child's skin. Then leave the towel there and cover it with a drape to keep in the heat.

10. End with the basic relaxation sequence.

ARM MASSAGE

Stand opposite the arm, at about the level of the child's hand. The following sequence is summarized in Checklist Box 3-6.

1. Perform the basic relaxation sequence (see page 70) and passive touch on the hand or forearm.
2. Apply oil or lotion.
3. Perform arm effleurage (see Figure 3-38). This stroke is similar to the leg effleurage stroke on both the front and the back of the legs. Begin by placing your inside hand palm-to-palm with the child's hand. Place your outside hand palm down on the back of the child's hand. With your fingertips pointing toward the shoulder, glide up the arm with both hands. Keep your hands par-

allel. When your inside hand reaches the armpit, it will simply glide back down the inside of the arm again. Your outside hand will glide up and over the top of the shoulder, crossing the anterior deltoid, the lateral end of the collarbone, the posterior deltoid and then, finally, glide back down the outside of the arm. Synchronize your hands by slowing down your inside hand as it leaves the armpit until your outside hand has circled the shoulder and comes back down parallel to the inside hand. Then both hands continue at the same time, gliding all the way down the arm and hand and gently stroking out to the fingertips. If the child is ticklish, avoid the ticklish area. Very light stroking generally makes the tickling worse. Begin with superficial pressure and, as the child's tissue becomes warmer and more relaxed, you may use medium pressure. Repeat 10 times.

4. Thumbstroke the inside of the arm (see Figure 3-39). Begin at the wrist and work up to the armpit, skipping over the antecubital area. Stay away from any ticklish areas. Use medium pressure. Do the entire inside arm once, slowly and thoroughly. This should take about 1 minute.
5. Perform arm effleurage three times.
6. Rake the outside of the arm (see Figure 3-40). Start at the top of the shoulder and work down the outside of the upper arm and the top of the forearm to the wrist. Do once, slowly and thoroughly, using medium pressure. This will require about 1 minute.
7. Perform arm effleurage three times.
8. Perform friction on the hand. Begin by rubbing your hands together as if you were warming them. Then make a "hand sandwich" with your inside palm against the child's palm and your outside palm on top of the back of the child's hand. Now rub briskly, just as you did to warm your hands. Continue for 15 seconds or more.
9. Thumbstroke the back of the hand (see Figure 3-41). Beginning at the base of the fingers, thumbstroke the entire back of the hand up to the wrist. Use medium pressure. Continue for 30 seconds or more.
10. Thumbstroke the palm (see Figure 3-42). Thumbstroke the entire palm, pushing from the base of the fingers toward the wrist and smoothing out all the creases. Continue for 30 seconds or more.
11. Stretch the fingers (see Figure 3-43). Use the thumb on top and index finger underneath as you massage each finger. Beginning at the base of the child's finger, slide out to the fin-



CHECKLIST BOX 3-6 ARM MASSAGE

1. Basic relaxation sequence and passive touch.
2. Apply oil or lotion.
3. Arm effleurage, 10 times.
4. Thumbstroke the inside of the arm, 1 minute.
5. Arm effleurage, three times.
6. Rake the outside of the arm, 1 minute.
7. Arm effleurage, three times.
8. Hand friction, 15 seconds or more.
9. Thumbstroke the back of the hand, 30 seconds.
10. Thumbstroke the palm, 30 seconds.
11. Stretch the fingers, three times for each finger.
12. Arm effleurage, 10 times.
13. Range-of-motion exercises for the shoulder, elbow, wrist, and finger joints.
14. Skin stimulation stroke.
15. Ball rolling.
16. Basic relaxation sequence.

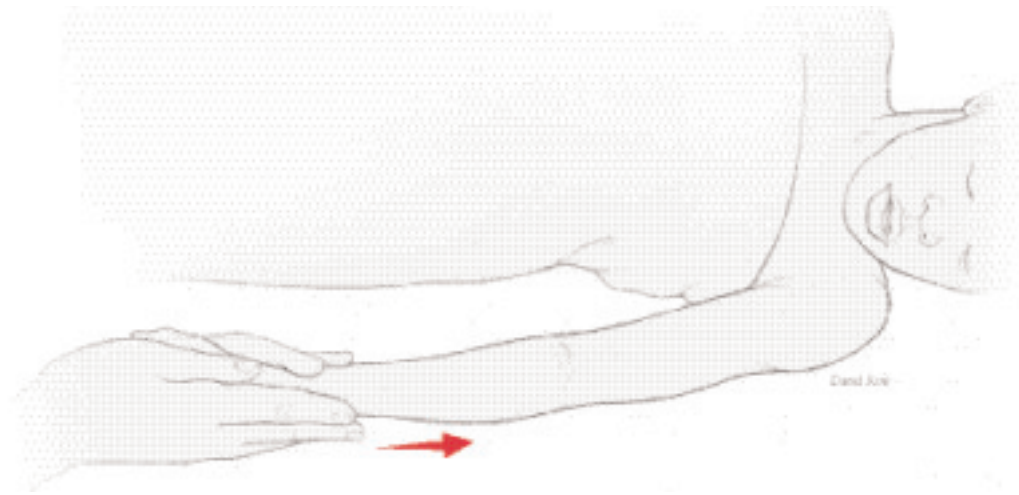


FIGURE 3-38 ■ Arm Effleurage.

- gertip, gently pulling at the same time. Gently pinch the end of each finger as you slide off, so that the fingertip receives a tiny bit of extra stimulation. Do each finger three times.
12. Perform arm effleurage 10 times.
 13. Perform range-of-motion exercises for the entire upper extremity:
 - Perform range-of-motion exercise for the shoulder joint, including flexion, extension, abduction, adduction, and internal and external rotation of the shoulder (see page 65).
 - Perform range-of-motion exercise for the elbow joint, including flexion and extension of the elbow and pronation and supination of the forearm (see page 65).
 - Perform range-of-motion exercise for the wrist joint, including hyperextension and flexion of the wrist (see page 66).
 - Perform range-of-motion exercises for the fingers, including extension and flexion (see page 66).
 14. Skin stimulation stroke. Choose one:
 - Cover the arm with a sheet and massage it with a textured massage tool or brush.
 - Do pincement or tapping of the entire arm.
 - Wipe off massage oil or lotion with a washcloth or piece of fake fur.
 - Perform a salt glow of the entire arm.
 15. Perform ball rolling of the entire arm. Move the ball up and down the length of the arm, then massage the back of the hand and each finger with the ball, moving in tiny circles. Press each finger into the massage surface with firm pressure.
 16. End with the basic relaxation sequence. Now move to the other arm, and repeat this series.

LEG MASSAGE (FRONT)

Sit at the foot of the table, near the lateral side of the child's foot. Small children may lay one leg across your lap. For better body mechanics, stand to the outside of the leg of when working with adult-size children; do not stoop or stretch to cover the entire area. The following sequence is summarized in Checklist Box 3-7.

1. Perform the basic relaxation sequence (see page 70) and passive touch on the top of the foot or lower leg.
2. Apply oil or lotion.
3. Leg effleurage (see Figures 3-44 and 3-45). This stroke is similar to the leg effleurage for the back of the leg (see page 75). Use medium pressure.



FIGURE 3-39 ■ Thumbstroking the Inside of the Arm.

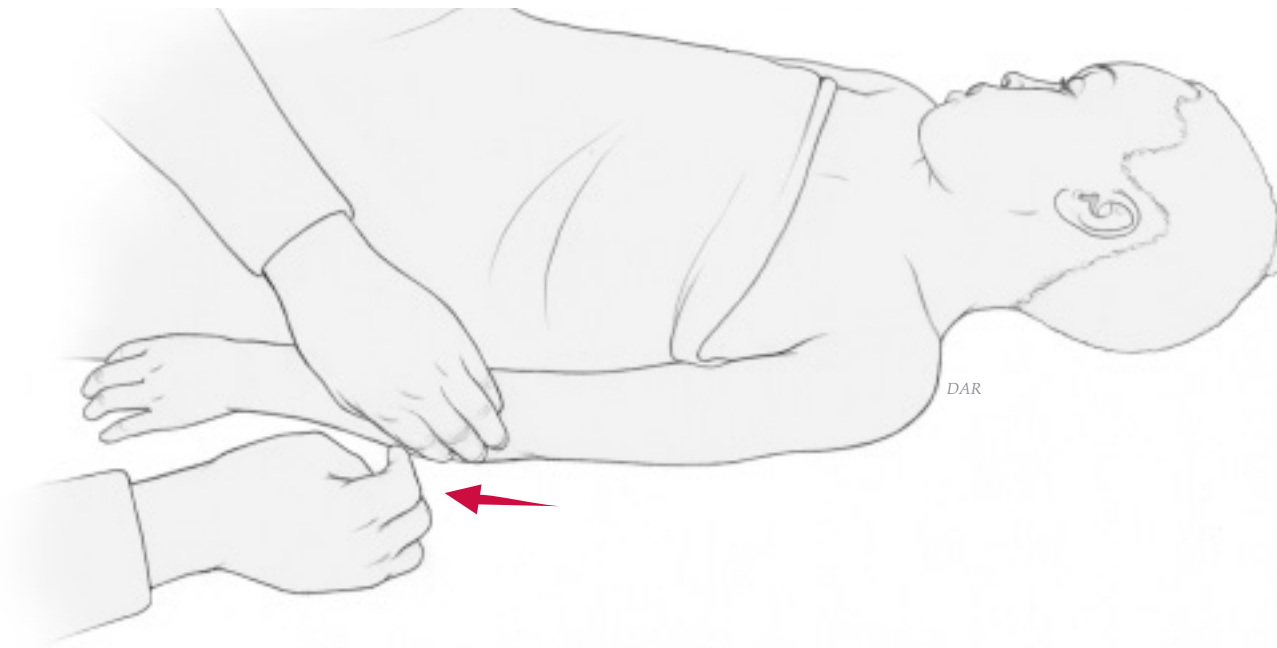


FIGURE 3-40 ■ Raking the Outside of the Arm.

Place both palms on the ankle. With your fingertips pointing toward the head and with your hands parallel, glide up to the top of the leg. Your inside hand will cover the inside of the leg, and your outside hand will cover the outside (lateral aspect) of the leg. Keep your hands directly across from each other. When your inside hand reaches the top of the leg, it will sim-

ply glide back down the inside of the leg again. The outside hand will glide up the outer half of the leg, trace the anterior iliac crest from its medial edge to its lateral edge, and then glide back down the outside of the leg. Synchronize your hands by slowing down the inside hand as it leaves the top of the leg until the outside hand has traced the iliac crest and come back down

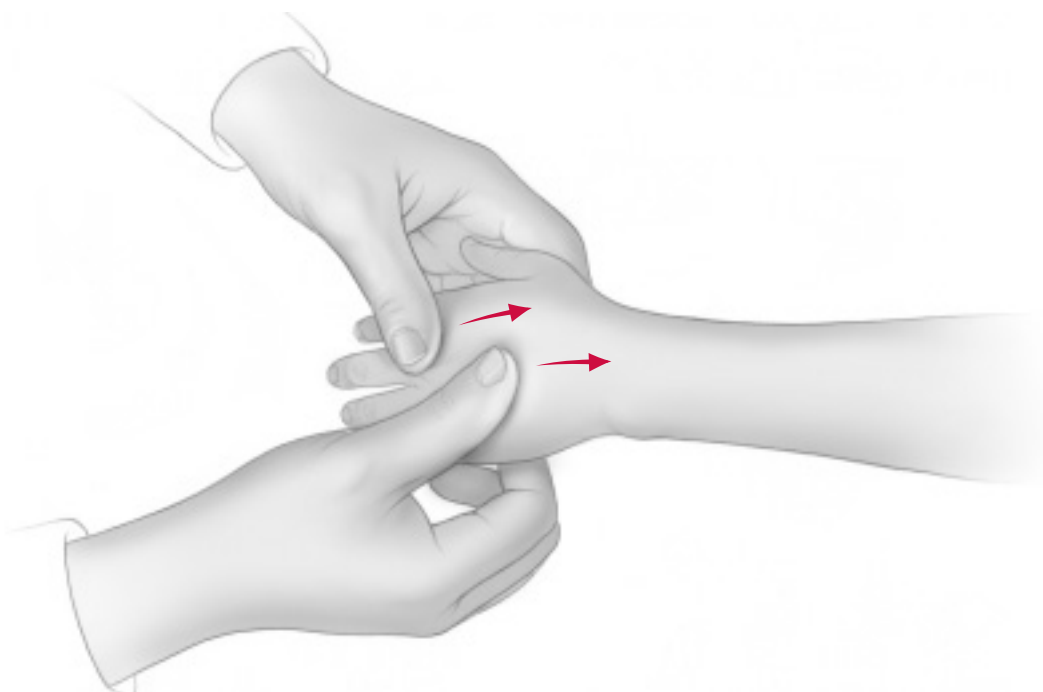


FIGURE 3-41 ■ Thumbstroking the Back of the Hand.



FIGURE 3-42 ■ Thumbstroking the Palm.

parallel to the inside hand. Both hands then glide all the way down the leg and foot at the same time, gently stroking over the top of the foot and out to the tips of the toes. Use superficial pressure at first. As the child's tissue becomes warmed and relaxed, you may use medium pressure. Repeat 10 times.

4. Rake the front of the leg (see Figure 3-46). Begin at the top of the leg. Move towards the feet; rake the entire thigh and around the patel-

la. Continuing toward the foot, rake the muscles on the medial side of the tibia from knee to ankle, then the muscles on the lateral side of the tibia from knee to ankle. Do the entire leg once, slowly and thoroughly. Use medium pressure. The entire stroke should take about 1 minute.



FIGURE 3-43 ■ Stretching the Fingers.



CHECKLIST BOX 3-7
LEG MASSAGE (FRONT)

1. Basic relaxation sequence and passive touch.
2. Apply oil or lotion.
3. Leg effleurage, 10 times.
4. Rake the front of the leg, 1 minute.
5. Circle the sides of the knees.
6. Tap directly on the patella.
7. Leg effleurage, three times.
8. Foot friction, 15 seconds or more.
9. Thumbstroke the top of the foot, 30 seconds.
10. Stretch and stroke the toes, three times for each toe.
11. Leg effleurage, 10 times.
12. Range-of-motion exercises of the hip, knee, ankle, and toe joints (see page 66-67).
13. Skin stimulation stroke.
14. Ball rolling.
15. Basic relaxation sequence.

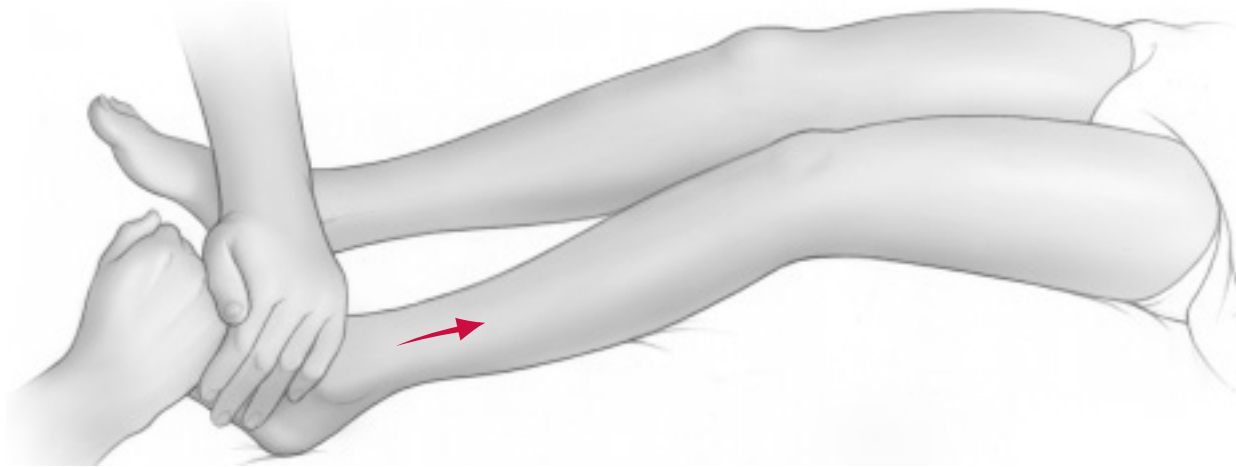


FIGURE 3-44 ■ Leg Effleurage. Starting position.

5. Circle the sides of the knees. Use the palm and fingertips of both hands at once, making wide circles on either side of the knee; this is similar to a tiny effleurage stroke. Repeat six times.
6. Tap directly on the patella with the fingers of both hands. Continue for 10 seconds.
7. Perform leg effleurage three times.
8. Perform friction on the foot (see Figure 3-47). Begin by rubbing your palms together as if you were warming them. Make a “foot sandwich” by placing your outside hand palm down on the top of the foot and your inside hand palm up on the bottom of the foot. Now rub briskly, just as you did to warm your hands. Continue for 15 seconds or longer.
9. Thumbstroke the top of the foot (see Figure 3-48). Beginning at the base of the toes, thumbstroke the entire top of the foot up to the ankle. Imagine that your thumbs are dipped in ink and you want to completely ink the top of the foot. Using medium pressure, thumbstroke for 30 seconds or longer.
10. Stretch and stroke the toes (see Figure 3-49). Hold the foot steady by putting your outside

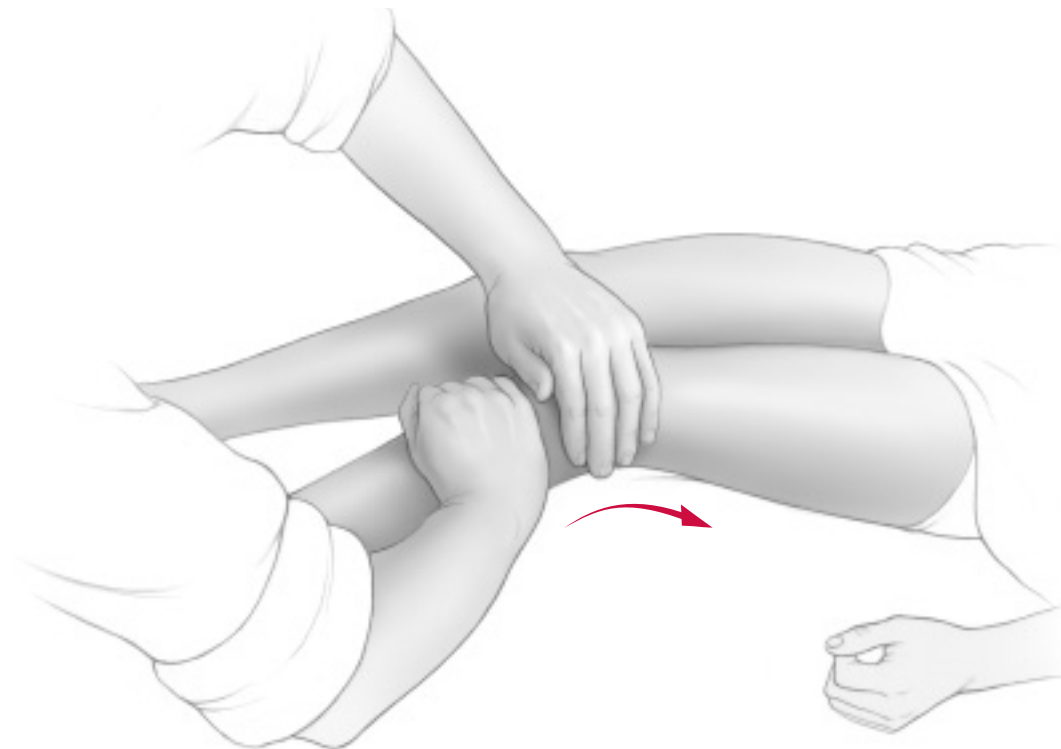


FIGURE 3-45 ■ Leg Effleurage. Your hands have glided over the knee and will continue to the top of the leg before returning to the starting position.

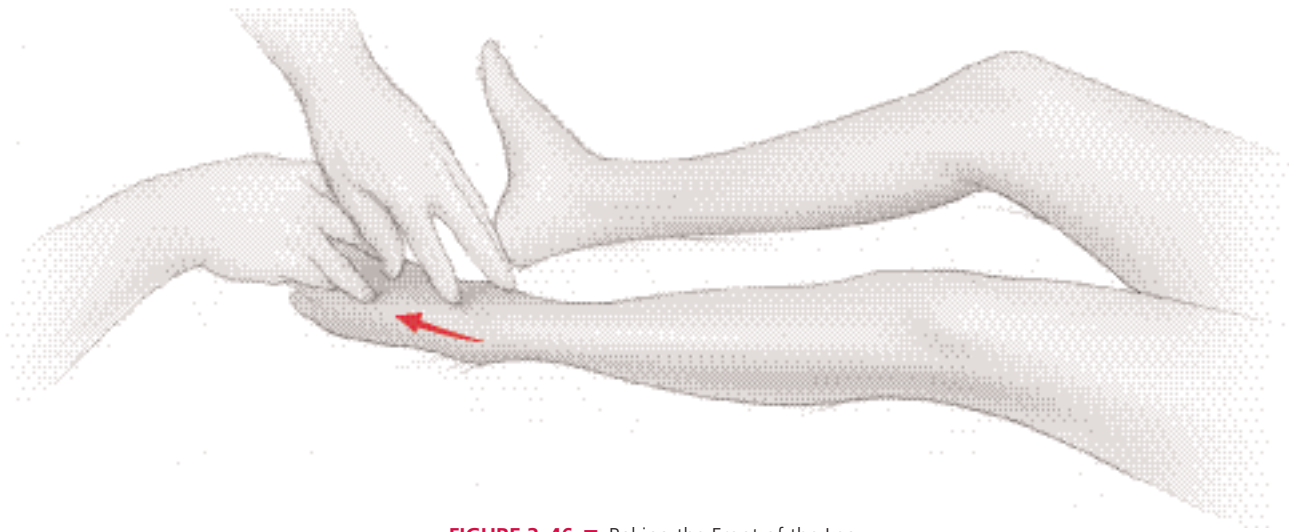


FIGURE 3-46 ■ Raking the Front of the Leg.

hand palm down on top of the ankle. With your inside hand, stretch and stroke one toe at a time. Beginning with the great toe, grasp each toe and gently rotate it in a circle three times, then rotate it in the opposite direction three times. To stroke, put your index finger beneath each toe and your thumb on top; gently pull as you slide from the base to the tip and off. Gently pinch the end of each toe as you slide off, so that the tip receives a tiny bit of extra stimulation. Stroke each toe three times. If the child is ticklish, skip this stroke and go back to foot friction instead.

11. Perform leg effleurage 10 times.
12. Perform range-of-motion exercises for the entire lower extremity:
 - Perform range-of-motion exercises of the hip joint, including flexion, extension, internal

and external rotation, adduction, and abduction (see pages 66–67).

- Perform range-of-motion exercises of the knee joint, including flexion and extension (see pages 66–67).
 - Perform ankle rotation (see page 67).
 - Perform toe rotation (see page 67).
13. Perform a skin stimulation stroke. Choose one:
 - Cover the entire leg and foot with a sheet, and massage with a textured massage tool or brush.
 - Do pincement or tapping of the entire leg and foot, including the kneecap.
 - Wipe massage oil or lotion off with a washcloth or piece of fake fur.
 - Perform a salt glow of the entire leg.
 14. Perform ball rolling of the entire leg.
 15. End with the basic relaxation sequence. Now move to the other leg and repeat.



FIGURE 3-47 ■ Foot Friction.

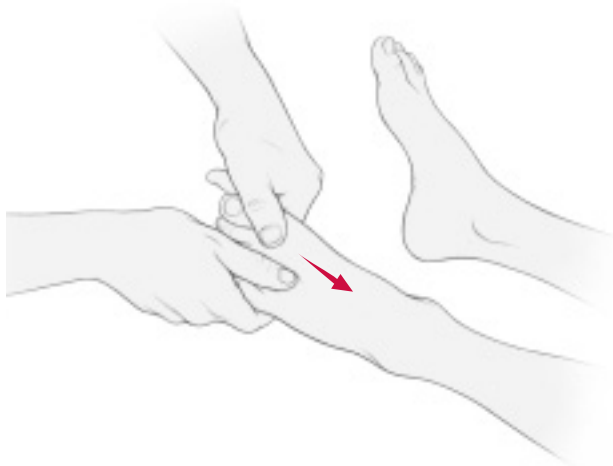


FIGURE 3-48 ■ Thumbstroking the Top of the Foot.

PRESSURE POINT MASSAGE

Many of the basic whole-body massage strokes you have learned so far are smooth and gliding and sweep over large areas. Except during passive touch, your hands are always in motion. The pressure point massage you will learn next is a different approach. As shown in Figure 3-50, individual fingers put slow, steady pressure on small, specific areas. Pressure point massage is an effective way to release deep tension, as long as great care is taken to apply the proper amount of pressure. Too little pressure will not release deep tension; too much pressure will be painful for the child. In Chapters 4, 5, and 6, you will learn how to use pressure points in combination with the basic Swedish massage strokes to treat common injuries and discomforts.

For each new pressure point, place the thumb or fingers on the specified spot. Use the flat of the finger, not the tip. Slowly increase your pressure until the child says the point is just beginning to hurt. Let up a little bit so that the point does not hurt. Hold each point for about 10 seconds, then slowly decrease the pressure and take your finger away. If you have difficulty locating a spot, the child can tell you where he or she is especially sensitive or tense.

HYDROTHERAPY AS AN ADJUNCT TO PEDIATRIC MASSAGE

BENEFITS AND TECHNIQUES OF HYDROTHERAPY

The therapeutic application of water, ice, or steam to the body is known as hydrotherapy. Because hydrotherapy, like therapeutic massage, can relax muscles, increase circulation, decrease muscle spasm,

relieve musculoskeletal pain, and help a child feel nurtured, it reinforces the effects of massage. Using hydrotherapy before massage allows you to work more effectively and can greatly increase a child's comfort and relaxation.

In the United States, hydrotherapy is not always within the scope of a massage therapist's practice. Statutes vary from state to state; in the state of Oregon, for example, the practice of massage includes "external use of hot, cold, and topical preparations such as lubricants." Therapists should investigate the regulations in their own state before treating children with the hydrotherapy treatments described in this book.

During hydrotherapy treatments, water may be applied externally to the entire body or to specific areas. Baths may be of varying temperatures. Sprays, frictions, hot or cold packs, hot or cold compresses, showers, saunas, or steam baths are external treatments, as well. Water may be also applied internally, in the form of steam inhalation, nasal rinses, gargles, douches, and drinking of water.

The most common forms of hydrotherapy used by massage practitioners today are the application of moist heat or ice. The application of moist heat to a specific area before massage increases blood flow, relaxes the tissue, and decreases pain. This allows you to work on deeper tissues with less discomfort for the child. A local ice application before massage increases local circulation and decreases pain and muscle spasm. This allows you to massage an area that is less sensitive and has more blood flow. These hydrotherapy applications not only have the direct physiologic effects mentioned above, they also involve careful personal attention and touch, which adds another nurturing element to a massage session. Before using any hydrotherapy application with children, always explain what the application is and why you are using it. Make sure they are comfortable during the application, and never allow them to become chilled.



FIGURE 3-49 ■ Stretch and Stroke the Toes.



FIGURE 3-50 ■ Pressure Point Massage.

Children have a greater proportion of skin surface area and can become chilled more easily than an adult. Observe them carefully and, if they appear to be having a bad reaction to a treatment, stop the treatment immediately.

Effects of Cold Applications and Treatments

The primary effect of a local application of cold is the contraction of the small blood vessels of the skin. There is an immediate reduction in blood flow as capillary blood pressure falls 6–11 mm of mercury and the skin pales. Blood is driven to the interior of the body as the blood vessels of the skin contract and the internal blood vessels dilate. This constriction of the capillaries of the skin lasts 5 to 8 minutes after the cold application is removed, when the capillaries then dilate. The final result is a capillary diameter, which is actually larger than before the cold was applied. This is the secondary effect of a cold application.

The contraction of the blood vessels in the skin and the shunting of blood into the interior is a reflex reaction to cold on the skin, and it takes place even before the tissue is significantly chilled. This is the body's attempt to maintain a core temperature of 98.6° F; by shunting warm blood back into the interior of the body, the brain and other vital organs are kept warm and heat loss through the skin is reduced. When the cold is removed, this pattern is reversed; the small blood vessels of the skin dilate and the internal blood

vessels contract. An increased amount of blood flows to the capillaries, and the skin flushes as blood is drawn to the surface.¹³

During the cold application, the decrease in surface blood flow, in turn, decreases inflammation. This makes cold therapy appropriate for acute sprains, bruises, muscle strains, acute bursitis, and acute joint inflammation.

Ice Massage

Ice massage is the application of ice to the skin, using an ice cube or ice chunk. After an injury (such as a severe bruise or joint sprain) or for a severe muscle spasm, ice massage can decrease local swelling and inflammation and relieve muscle spasm. Make a chunk of ice by filling a paper cup with water and freezing it. Hold the cup of ice in one hand and gently rub the ice in a circular motion over the particular body area, including a few inches above and below the area as well (see Figure 3-51). Perform ice massage for about 5 minutes.¹⁴ After an injury, ice massage can be done as often as once an hour to relieve pain and to increase circulation.

Many children dislike ice applications unless a few simple precautions are followed. First, make sure the child is warm and that rivulets of water are not going to trickle down in a sensitive area. Drape towels around the area to be iced, if necessary. Second, warn the child before the ice first touches the skin. Finally, if the child complains about the cold after a few min-



FIGURE 3-51 ■ Ice Massage.

utes, stop using the ice for a short time, then try again. Ice massage feels more intense than an ice pack and, for some children, it is also more difficult to tolerate.

Ice Pack Application

Commercial ice packs or ice bags are easy to obtain or you may use homemade ice packs (a plastic bag filled with crushed ice or ice cubes). Place a thin layer of cloth, such as a pillowcase, on the skin and lay the ice pack on top. Ice packs should be applied for no longer than 15 minutes; after an injury, they may be used in intervals of 15 minutes on and then 15 minutes off. Repeat as needed. The rest period avoids any cold damage to the child's tissue, such as frostbite.

Many children are reluctant to have ice on their body, so be sure to warn them before the ice is applied and tell them a special effort will be made to keep the rest of their body warm.

Heating Compress

A heating compress is a mild, prolonged application of moist heat that, despite its name, begins with cold water. It is generally applied for several hours or overnight. Typically, a cotton cloth dipped in cold water is applied to one area of the body and then covered with wool or other insulating material. The child should always be thoroughly warm before the compress is applied. Heating compresses are used to relax muscles and to relieve the discomfort of sore throats, rheumatic joints, or chest colds, and can relieve congestion in certain areas. The cold socks treatment (see page 121), which is used to decongest the head of a child who has a cold, is a type of heating compress.

Heat Application and Treatment

The primary effect of local heat application is dilation of the blood vessels of the skin. This increases the loss of heat from the skin and helps the body maintain its core temperature of 98.6° F, protecting the brain and other internal organs from overheating.

The peripheral blood vessels dilate as a reflex reaction, even before the area is significantly heated. As blood rushes to the area, the skin turns pink, local tissue metabolism increases, and more white blood cells move to the area. The tissue under the hot application begins to sweat, the muscles relax, and pain is reduced.

You can take advantage of the body's reaction to heat in many therapeutic ways. The primary effect of heat, the dilation of blood vessels, will shift blood from somewhere else in the body to fill the dilated vessels. When congestion may be causing symptoms, such as migraine and sinus headaches, a hot foot or hand bath can help draw congestion from that area (see *Migraine Headaches*, page 135-136). Hot applications in local areas relieve muscle tightness and pain. Heat, like touch, is experienced by children as comforting and nurturing. When a child is tense or nervous about receiving a massage, the addition of heat through warmed linens, rice-filled, microwaveable bags, or moist heat packs can help them feel more relaxed. Do not apply heat in the acute stages of injuries such as bruises, sprains, and dislocations.

Hot Footbaths

The hot footbath is a local heat treatment. The child sits in a chair wrapped in a sheet or blanket, with both feet in a container of water (110° F) for about 20 minutes; he receives a cold compress to the forehead at the same time. However, a hot footbath can also be given with the child laying supine on a treatment table with the feet in the container of water (see Figure 3-52). The water temperature must remain at 110° F during the entire treatment, and the cold compress should be changed every 3 minutes. At the end of the treatment, cold water is poured briefly over the child's feet, they are dried, and the child then rests for 10 to 15 minutes. This technique is contraindicated for those with insulin-dependant diabetes or loss of feeling in the legs.¹³

Hot Packs or Hot Moist Towel Application

The application of moist heat relaxes muscles, relieves pain, and helps the child feel comforted and nurtured. It can also keep a child warm during a massage. Moist heat is used because it penetrates more deeply than dry heat.

- Hot moist heating pads or Hydrocollator packs: Put one or two dry towels on the area of the child's body that is going to be treated. Then apply a moist heating pad or Hydrocollator pack, and cover with another dry towel. The dry towel against the child's skin protects against burns and the dry towel on top of the hot pack keeps in the heat. Check with the child to make sure the hot application is not too hot and check it frequently. Add more towels underneath the hot pack if it is too hot. Cover the



FIGURE 3-52 ■ Hot Footbath. Normally the child would be covered by a sheet or blanket, but it has been removed for clarity's sake.

child with a sheet. Hot packs should be left on for 15 minutes unless otherwise noted.

- Hot moist towels: They can be applied directly to the child's skin, as they are generally not as hot as heating pads or Hydrocollator packs. Wring them out in hot water, apply to the child's skin, and cover with a dry towel. Check with the child to make sure that the hot towels are not too hot and check his or her skin frequently.

Salt Glow

A salt glow, or salt rub, is both stimulating and relaxing to the skin and the underlying muscles. It also increases local blood flow. Many children enjoy it as a combination of a back massage and a "back scratch." It is excellent for any child who is immobilized because of illness or injury and cannot increase his or her own circulation through exercise. During a salt glow, three types of skin stimulation are combined: the temperature of the water; the actual friction with the salt; and the washing and drying of the skin. While it is possible to do a salt glow of the entire body, you would need to use a bathtub and have the child completely undressed. Instead, it is more practical for you to do salt glows on smaller areas, such as the back, the legs and feet, or the arms and hands. A salt glow of the back is shown in Figures 3-53 and 3-54. For a child who is sensitive or tactile defensive, you may do a salt rub of a very small area, such as the hands. You will need the following equipment:

- two bowls of warm water at 110° F
- one towel
- two washcloths or terrycloth mitts
- about one-quarter cup Epsom salts, moistened with just enough water so that it clumps together but does not dissolve the salt

To perform a salt glow on one part of the body, begin with the child lying on a towel on the therapy



FIGURE 3-53 ■ Salt Glow Massage. A massage performed using salt; the skin becomes pink as a result of increased circulation in the skin.

table or on the floor. Explain that he will feel warm water on the area. Gently wash the back, arm, or leg with warm water. Now tell the child that he will feel the salt on the body part. Take about one tablespoon of the moistened salt in your hands, and spread it on the back or arm or leg. More salt may be needed, depending on the size of the area. Use a brisk upward movement with one hand while making a brisk downward movement with the other hand; as you alternate hands, you will be giving a friction-type massage. Move from one end of the area to the other and back again, using gentle pressure and always moving briskly. Continue for 1 to 3 minutes, depending on the size of the child and the child's reaction. The skin will quickly become pink. Ask the child to tell you when the salt starts to feel "too scratchy." Often the child will enjoy the abrasive and stimulating nature of the salt for a time and then will start to feel that it is too abrasive. Should the child complain that the salt glow is uncomfortable, stop immediately. To complete the salt glow, gently wash the salt off with the wet washcloth or terrycloth glove, and dry the child with the other one. An additional sensory stimulation technique that may be added at this point is to wash the salt off



FIGURE 3-54 ■ The salt glow is completed by gently washing off the salt with water.

with water, then use a small amount of liquid soap and wash the back with soap lather, rinse it off with clean water, and dry the back. This gives the child a dramatic contrast between the scratchy feeling of the salt and the creamy feeling of the soap lather.

The towel that was underneath the child will have salt crystals on it and should be removed before proceeding with the massage. Ask the child to roll first to one side and then to the other as you fold the towel over the crystals and remove it.

The salt glow is contraindicated if the involved area has a cut, rash, or any open skin. It is also contraindicated in any child who shows extreme fearfulness.

Contrast Treatments

Contrast treatments are applications of heat alternated with applications of cold. They produce a greater increase in the local circulation than either a hot or a cold application alone. Alternating hot and cold applications causes the blood vessels to alternately dilate and contract, increasing the circulation to an area by 70–100%. Contrast treatments are excellent for reducing swelling in sprains and other traumatic injuries and can dramatically relieve pain.¹³

In contrast treatments, one cycle of hot followed by cold is called one *change*. The number of changes may be different for different conditions, as may be the amount of time the hot or cold is continued. A standard contrast treatment, however, consists of three changes of 3 minutes of heat followed by 30 seconds to 1 minute of cold. Different forms of heat, such as hot water, Hydrocollator packs, moist heating pads, or hot compresses may be used. Different forms of cold such as cold water, cold compresses, or ice massage may be used. Figure 3–55 shows a contrast treatment for the chest, and Figure 3–56 shows a contrast treatment for the eyes.

Hydrotherapy Safety Precautions

Hydrotherapy is safe, but you should always follow these precautions, using common sense:

1. Because some hydrotherapy treatments involve immersing a part of the child's body in water, it is possible that some water might be spilled on the floor. Mop up any spills immediately so that there is no chance of anyone slipping.
2. Children should be monitored even more carefully than adults for their reaction to the hydrotherapy applications. Their skin is thinner, and they may be burned more quickly by hot applications. Use plenty of towels under hot packs so that children do not get burned. Ask the child frequently how the hot pack feels on his skin and, occasionally, lift up the hot pack and check it. Add more towels on the child's skin if necessary.
3. Although highly unlikely that a child's skin might be frost-damaged from ice therapy, it is possible. Watch the clock when timing ice treatments—don't leave ice on for more time than called for.
4. Pay close attention to your pediatric patient. If you see a child reacting in an unusual way, immediately ask him or her about it. Terminate the treatment if the child seems to be uncomfortable.
5. Always check water temperature with both a water thermometer and your hand.
6. Exercise caution when handling hot packs, so your hands are not burned. Use metal tongs or rubber or leather gloves while handling hot packs of any type.

In this chapter, you have learned how to perform a full-body Swedish massage that is suitable for all chil-



FIGURE 3–55 ■ Contrast Treatment of the Chest. **A**, The boy has just had a hot pack applied to his chest. **B**, The therapist is rubbing his chest with cold water.

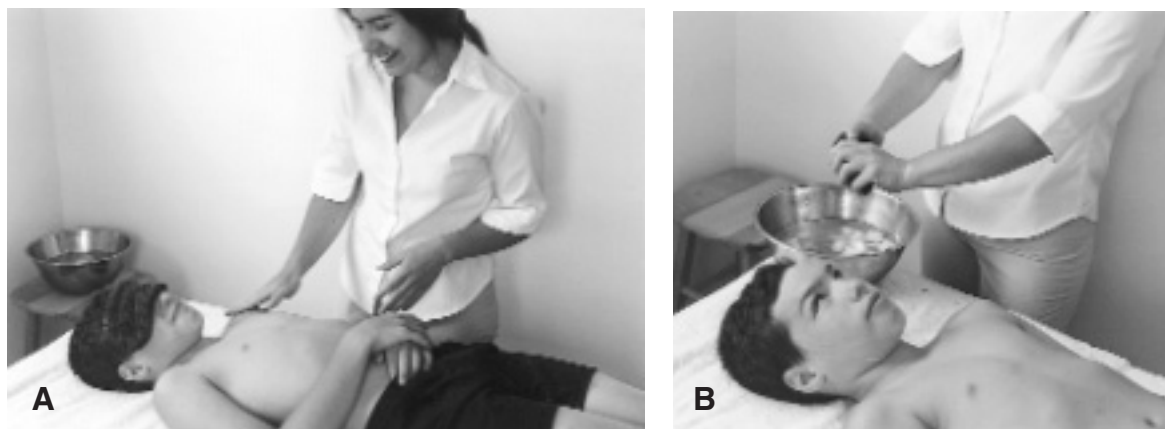


FIGURE 3-56 ■ Contrast Treatment for the Eyes. **A**, The boy has just had a hot cloth applied over his eyes. **B**, A cloth is being wrung out in cold water for the cold application over his eyes.

dren. It incorporates the classic Swedish techniques of passive touch, effleurage, petrissage, tapotement, friction, and range-of-motion exercises. It also includes sensory stimulation and relaxation techniques. Once you have thoroughly learned these techniques, you may enrich them by including techniques from other forms of massage and bodywork. However, the basic techniques presented in this chapter contain enough variation and possibility for creativity to keep your work both effective and interesting for years to come. In Chapters 4, 5, and 6, you will learn adaptations of the basic techniques for specific situations. This will enable you to treat children with injuries, minor discomforts, special needs and chronic conditions.

REVIEW QUESTIONS

1. Explain the benefits of using Swedish massage, passive range-of-motion exercises, skin stimulation techniques, ball massage, and pressure point massage with children.
2. Discuss some reasons for using relaxation techniques prior to and during the massage.
3. Give three examples of how a hands-on therapist can alter the strokes and structure of a massage session to reflect the child's unique needs and preferences.
4. Explain how the massage techniques in Chapter 3 can be adapted for these individual children:
 - a. A 3-year-old child with stranger anxiety.
 - b. An active middle school boy whose body has many bruises and scrapes in various stages of healing.
 - c. An athletic teenage girl who has deep concerns about her weight, despite the fact that she is actually at her ideal weight.

d. A teenage boy who has been experiencing a great deal of stress. He has been referred by his physician for help with severe headaches. He would rather "die" than remove an article of clothing in front of his mother, let alone in front of a strange therapist.

5. Discuss the body's reactions to local application of heat. Why does the body react to the hot application in these ways? List three examples of situations when local heat application is indicated.
6. Discuss the body's reactions to local application of cold. Why does the body react to the cold application in these ways? List three examples of situations when a local cold application is indicated.

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MASSAGE AND HYDROTHERAPY FOR PEDIATRIC INJURIES

4

KEY POINTS

After reading this chapter, the student will be able to:

1. Explain the most common causes of childhood injury and list strategies to prevent these injuries.
2. Give specific examples of injuries that children are more likely to have than adults and explain the reasons why.
3. Discuss, in detail, the impact of dislocations, fractures, and sprains on soft tissue in or near the sites of these injuries.
4. Understand the differences between acute injuries and their long-term effects and give examples.
5. Explain the rationale for using massage and hydrotherapy to treat each injury in this chapter.

It is a rare child who grows to adulthood without having many minor injuries and at least one major injury. Because they are not developmentally mature enough to assess danger or understand the consequences of their behavior, children are far more likely to be injured in accidents than are adults. Jumping from dangerous heights, riding bicycles unsafely, playing with fire, and darting out into traffic are just some of the risk-taking behaviors that put children in harm's way. Injuries are the leading cause of pediatric death and the second leading cause of hospitalization in the United States.¹ In 1999, 25% of American children sustained an injury that required medical attention. Of those children, nearly 120,000 were injured severely enough to become permanently disabled. One of 25 children received medical attention as a result of head injury alone. (These statistics do not include the number of children injured by violence or suicide attempts, which are considered intentional injuries, rather than by accidents). Any massage ther-

apist who works with children will most likely be treating both acute and chronic injuries.

PEDIATRIC INJURIES

PATTERNS OF PEDIATRIC INJURIES

Knowing about the causes of pediatric injuries can help you understand when children are most at risk of being injured and how many of their injuries are preventable.

- Falls and motor vehicle accidents are the two most common causes of injuries, followed by drownings and fires. A concussion caused by a fall is a common reason for children to be hospitalized for trauma; however, a fall can also cause serious injury to other parts of the body. Motor vehicles are such a major source of injuries that orthopedic surgeon John Ogden calls the auto-

mobile “the principalcrippler of children.”² Children injured in car accidents may be involved as passengers, pedestrians, or bicyclists.

- 10–25% of all injuries in preschool children may be a result of child abuse.²
- 40% of emergency department visits for injuries occur between May and August when children are more likely to be playing outdoors without adult supervision. The majority of accidents occur in the evening hours for the same reason.
- 50% of nonfatal injuries are in or around the home. The typical bike crash occurs within one mile of home.³
- In all stages of childhood, boys receive far more injuries than girls, as a result of their engaging in more rough play and more dangerous activities.
- Poor children have higher levels of both nonfatal and fatal injuries.

REDUCING PEDIATRIC INJURIES

Because pediatric injuries are a major public health problem, information on how to prevent them should be common knowledge. Reducing unintentional childhood injury is possible through the following preventive measures:

- Use protective gear for activities such as biking, horseback riding, skateboarding, scootering, inline skating, and snowboarding. If a child hits his head during one of these activities, helmets can reduce the risk of brain injury by as much as 88%; however, only 15–25% of children wear helmets when bicycling. In a nationwide study, 56% of children hospitalized for a bicycle-related injury had a traumatic brain injury; almost all were caused by automobile collisions.³ Other examples of protective gear are knee and elbow pads and athletic mouth guards.
- Wear car seat belts.
- Provide adequate supervision during sports and at home. Responsibility for traffic safety should not be given to children; those younger than ages 11 to 12 are not developmentally mature enough to assess distance and speed and negotiate traffic safely.⁴
- Teach children about fire safety.
- Teach children how to act safely at home, at school, and in public. Traffic safety should be a priority because a large number of serious childhood injuries involve motor vehicles.

GENERAL APPROACHES TO PEDIATRIC INJURIES

When medical cautions/contraindications are followed, massage and hydrotherapy can be extremely



POINT OF INTEREST BOX 4-1

Pediatric Sports Injuries

The sports with the highest risk of injury to children are football, basketball, gymnastics, soccer, and baseball.¹ Injuries occur more frequently in contact sports; for example, 20–40% of high school football players are injured each year. Older children are more likely than younger children to be injured while playing contact sports, probably because sports are played more aggressively as children grow older. Injuries in young athletes cover a broad spectrum of damage to bone and soft tissue; the severity of the injury will depend on the skeletal and physiologic age of the child, the particular sport, and the severity of the trauma.² Teenagers have more lower-extremity trauma, with knee injuries being the most common, and younger athletes have more contusions, sprains, and simple fractures of their upper extremities. The joint most commonly sprained is the ankle.¹ Organized sports account for only about one-third of sports injuries, with the remainder occurring in physical education classes and in nonorganized sports, such as skateboarding.¹ Prevention of sports injuries should include:

1. The use of safety gear appropriate for each sport, including helmets, face guards, eye protection, proper footgear, padding, and other body protection.
2. Careful supervision of children while they are playing.
3. Following appropriate rules.
4. A preseason-conditioning program, which includes warm-up, stretching, running, weight training, and skill development. This type of program can prevent injuries, especially in collision and contact sports.¹
5. Adequate rehabilitation of injuries. Inadequate rehabilitation probably accounts for one-fourth of sport-related injuries, due to residual problems from prior injuries.¹

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important in relieving discomfort, promoting healing, preventing long-term soft tissue dysfunction and pain, and helping with long-term symptoms from injuries such as spinal cord and traumatic head injuries.

AMPUTATIONS

“It is imperative, when massaging a person with an amputation or any other deformed condition, to approach them with pure love, respect, and willingness . . . approach this body with confidence. It’s a survivor!”

—Dianne Percoraro¹

An amputation is the removal of a limb or a part of a limb. Trauma is the major cause of amputation in childhood. Power lawn mowers are the primary cause of traumatic injuries resulting in amputation, followed by motor vehicle accidents, farm injuries, and gunshot wounds. In war-torn countries, land mines are a leading cause of amputation. Amputations of the upper extremity, more common than those of the lower extremity, are most often caused by machinery. Amputations may also follow tissue damage from tumors, burns, or gangrene. Boys suffer amputations twice as often as girls.²

APPROACH AND GOALS

Traumatic amputation is acutely stressful because it involves significant pain, stressful medical treatment, and a significant alteration of the child’s body image. Long after the initial injury, the use of prostheses and changes in mobility and appearance may continue to cause the child significant stress. However, each child’s situation is different; the long-term psychological effect of an amputation depends on where it is located, how different the child now looks from other children, and how much emotional support the child has.

The initial physical therapy goals for children with amputations are maintenance of range of motion and muscle strength. Massage helps maintain range of motion and also benefits the child in other ways. Locally, it softens stump adhesions and decreases edema in and around the stump and can increase range of motion in the joints proximal to the stump. When other muscles compensate for the missing body part, they can become overly tense or sore. For example, when one leg is amputated above the knee, there will be compensations and discomfort at the hip directly above the knee, the entire other leg, or in the back. Massage helps relieve discomfort and tension in the compensating muscles and prevents contractures from developing. Massage can help children accept the stump and have a positive, whole body image.

Use the basic massage techniques presented in Chapter 3, adjusting pressure to the child’s tolerance level and causing no pain. A whole-body massage is ideal for any child with an amputation because



POINT OF INTEREST BOX 4-2

Massage in Thailand for Children With Amputated Limbs

Pamela Yeaton, a nurse and massage therapist, has worked in health care and health education in a number of third-world countries, including 3 years with the Peace Corps in Bangkok, Thailand. In Bangkok, she worked with the Foundation for the Welfare of the Crippled, treating children, training physical therapy aides, and supervising the therapy of more than 200 children. Crippled by polio, cerebral palsy, and accidents, children came from throughout the country. Those with amputations, most commonly from leg injuries from land mines, came to the Foundation about 6 months after the surgery. Children, as young as age 5, were taught to self-massage and stimulate their stumps and to help each other with range-of-motion exercise. Much of the information in this section is drawn from Ms. Yeaton’s extensive experience (Yeaton P, personal communication, April 1992).

musculoskeletal compensations are likely to be found throughout the entire body. A child using crutches, for example, will have increased strain and tension in the muscles of the upper body. The following massage technique is effective for treating local discomfort and muscle tension:

- An ideal method of treating the stump is 10 minutes of massage on the stump in the morning before putting on the prosthesis and 10 minutes at night after removing it.
- A parent or other family member would be the ideal person to perform this daily therapy.
- Any touch may be difficult on a painful stump. Hydrotherapy is an excellent way to improve the child’s tolerance for tactile stimulation; it can improve circulation to the stump and is an excellent beginning to the massage experience.

MASSAGE AND HYDROTHERAPY FOR AMPUTATIONS

CONTRAST TREATMENT OF THE STUMP

When performing a contrast treatment, use caution with the temperature of hot and cold applications. If the stump is sensitive, hot applications may need to be cooler and cold applications warmer. Ask the child to tell you what feels right. The contrast treatment may be extended to the entire extremity by using a larger hot pack or multiple hot packs.

Step 1. Apply a moist heating pad or Hydrocollator pack to the amputation stump for 3 minutes.

Step 2. Wring out a washcloth in ice water, and rub the stump for 30 seconds, or do ice massage for 1 minute.

Step 3. Repeat hot and cold twice (three changes total).

MASSAGE SEQUENCE FOR AMPUTATIONS

Step 1. Begin with the basic relaxation sequence, followed by visualization. Have the child visualize the missing limb and then breathe into it while exhaling. For example, if a hand has been amputated, she can visualize the hand while inhaling and, when exhaling, breathe all the way to the visualized fingertips.

Step 2. Apply oil or lotion to the entire extremity, but not on the stump. Cocoa butter or vitamin E oil on the incision, if newly healed, prevents cracking and drying of the scar tissue and relieves itching.

Step 3. Use the arm effleurage or leg effleurage strokes presented in Chapter 3 and give 2 to 3 minutes of warming superficial effleurage to the stump and the entire extremity.

Step 4. Specific Massage of the Amputation Stump

- Start with gentle, but firm, pressure on and around the stump; hold this pressure to the count of 10. When the child can tolerate this pressure, the therapist can slowly work into gentle massage techniques. If pain continues to be a problem, consult the child's physical therapist, physician, or prosthetist.
- Use gentle thumbstroking massage over the stump for about 2 minutes, depending on the child's tolerance.

Step 5. Passive range-of-motion exercises. Perform passive range-of-motion exercises on all joints of the extremity. If the child's hand has been amputated, for example, do the exercises on the wrist, elbow, and shoulder joints. The exercises should always be done on the other limb, as well. While passive range-of-motion exercises are helpful, when the joint has full range of motion, the child should learn to perform active range-of-motion exercises.



Consult with the child's physician to obtain permission before massaging a child's amputation stump.

BIRTH TRAUMA

As labor begins, the fetal head is nearly half of the total body mass and the largest impediment to passage through the birth canal. The lower jaw is relatively undeveloped—a prominent, bony chin would make birth even more difficult. For the head and body of the fetus to leave the womb during the normal birth process, the mother's pelvis must become as wide as

possible, and the head of the fetus must become as narrow as possible. (To prepare for birth, the mother's pelvic ligaments began to soften months before delivery.) As labor begins, the vaginal wall muscles stretch and the cervix widens. As the mother's uterine muscles propel the fetus toward the birth canal, the head is compressed and the skull becomes longer and narrower as the cranial bones overlap each other. In 95% of all births, the baby's occiput faces toward the inside of the mother's pubic bone, with one cheekbone turned toward the mother's tailbone. The top of the baby's head, which is the narrowest part, comes through the birth canal first (see Figure 4-1). The occiput is still in four separate pieces and receives great pressure as it leads the way out of the birth canal. Normally its upper edges slide under the parietal bone. Either or both condyles of the occiput can be compressed, or one can shift forward and one shift backward.¹

The normal birth described above causes a certain amount of stress to all infants, but does not cause actual physical injury. Complications that may lead to birth trauma or injury include:

1. Caesarean section. Before this surgery takes place, labor may have been prolonged for some reason, such as the mother's pelvis not being wide enough to accommodate the fetal head. Molding of the cranial bones may be exaggerat-

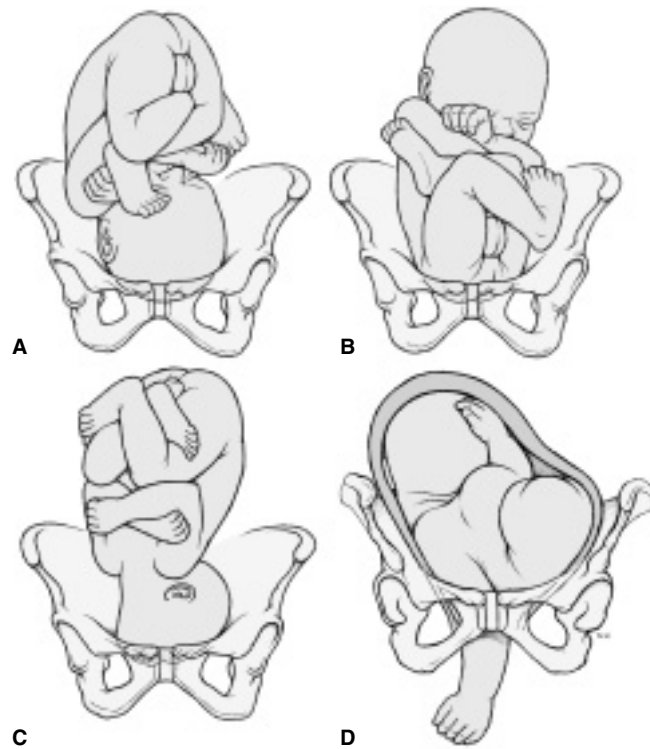


FIGURE 4-1 ■ Various Fetal Positions at Delivery. Reprinted with permission from *Stedman's Medical Dictionary*. Ed. 27. Baltimore, MD: Lippincott Williams & Wilkins, 2000, p 1441.

- ed, such as when the frontal bone overlaps the parietal bone.¹
2. High forceps delivery. The use of forceps to draw the fetal head out of the birth canal can cause compression of the temporal bones, the wings of the sphenoid bone, or the maxillary bones. Facial paralysis may result if the pressure applied to the sides of the head irritates the facial nerves. This condition often disappears spontaneously within a few weeks; however, the pressure may have long-term effects on the infant's soft tissue.
 3. Induction of labor and prolonged or precipitous labor can traumatize the head of the fetus. A small percentage of infants acquire cephalohematomas (a collection of blood under the skin of the scalp, on the back or side of the head) caused by trauma to the blood vessels in the scalp during delivery. Rarely, this hemorrhage occurs together with damage to the brain. Overly intense or prolonged uterine contractions can also cause subdural hemorrhage or suboccipital strain.²
 4. A breech delivery, in which the buttock presents first, occurs in about 3% of births. Problems delivering the fetus's head can result in muscular torticollis; dislocations or fractures of the clavicle, hip, or shoulder joint; and brachial plexus birth palsy. Minor spinal cord damage can occur during breech delivery, with traction applied to the trunk when manipulating the aftercoming head.³ Because breech position in utero is now an indication for cesarean birth, breech deliveries are less frequent than in the past.
 5. Severe trauma to the mother during pregnancy, such as a motor vehicle accident resulting in pelvic fracture.
 6. Other problems with the delivery of the head, as sometimes occurs when twins lie on top of each other in utero, or in face-first or transverse presentations.

Every infant's cranial bones are molded to some extent to exit the birth canal. In a normal birth, the molding will correct in 5 to 6 days, partially via lusty crying and active sucking.¹ If the infant's position was abnormal during delivery, the position of the cranial bones may be affected. There may be compression or lateral strain of the cranial base, or a distortion of the occipital condyles may affect the way the occiput is positioned on top of the atlas (first cervical vertebrae). Birth trauma can have lasting effects, as shown in the following examples:

1. Birth trauma may initiate patterns of myofascial restriction, malalignment of bones, or

myofascial trigger points that continue to influence a person throughout life. For example, although a link between cephalohematoma at birth and the presence of head and neck trigger points has not been proven in an older child, the amount of force it requires to cause trauma to the blood vessels in the scalp is also enough to cause trigger points in the myofascia of the skull. Psychiatrist and former pediatrician, using age-regression hypnosis, David Cheek found a connection between a 50-year-old man's lifelong migraine headaches and the man's birth. When forceps were applied to the head during birth, one blade had pressed hard just above one eye orbit, and the other blade had compressed his occiput.⁴ Trigger points in the temporalis, occipitalis, and posterior cervicals, all of which may be caused by birth trauma, are known to induce migraines.⁵

2. Brachial plexus birth palsy is a birth injury that causes paralysis of the arm muscles. Occurring in about one in 400 births, it is more common in large babies; babies who experienced prolonged or traumatic deliveries, especially when extraction techniques were used; babies born in a breech position; and babies born shoulder first. In these situations, the infant's shoulder is easily stretched and the nerves can be stretched, torn, or ruptured. The actual injury site is the upper trunk of the brachial plexus (less common) or the roots of cervical nerves C5 and C6 (most common). The nerve damage causes weakness in the deltoid, bicep, brachialis, supinator, supraspinatus, infraspinatus, and subscapularis muscles. Injuries that do not heal well are likely to cause permanent weakness, deformities, and contractures of the upper extremity.⁶ Regular massage is an effective therapy for the symptoms of this condition. A patient of the author's was born in Germany in 1930 with brachial plexus birth palsy. As a child, he went weekly to a physical therapist who massaged and stretched his arm. His arm was straight and he had full use of it until his treatments stopped at age 11. His arm then became progressively flexed against his chest until, in his forties, it was permanently fixed in that position (Ze'ev O, personal communication, July 1991).
3. Ten percent of cerebral palsy cases are from birth injuries.²
4. Although no statistics are available, research generally supports the theory that there is a higher incidence of attention deficit disorder in children who had problems during delivery, such as a long or hard labor or forceps delivery.⁷

5. Clint Nelson, a cranial dentist and massage therapist, believes that cranial bones that are compressed into abnormal positions during delivery can cause other bones, such as the maxilla, to shift position, eventually ossify, and lead to malocclusion and bite problems (Nelson C, personal communication, July 2002).

APPROACH AND GOALS

Massage therapists should not treat newborns without special training. If you are working with children, however, be aware that, although they are young, children may have long-standing myofascial or skeletal restriction from birth events. Infant massage is an excellent therapy that can help infants relax and accept healthy touch. Gentle stretches, facial massage, and stroking can ease newborn discomfort from suboccipital strain.⁸ Barry Gillespie, dentist, massage therapist, and teacher, teaches a newborn bodywork sequence that involves craniosacral, fascial, and muscle therapy. First the child's occiput, sacrum, and frontal bones are treated with craniosacral manipulation. Then the entire body is treated with myofascial release techniques. Finally, the sequence includes Swedish massage that begins at the legs and proceeds to the head. The average treatment lasts 15 to 20 minutes. If the child had an uncomplicated delivery with no major problems, she should not need further bodywork until about age 1, when children begin walking and, frequently, falling.⁹

BRUISES

A bruise is an area of discolored or black-and-blue tissue that is a result of injury (usually some kind of an impact). Capillaries beneath the skin break and blood leaks into the surrounding tissue. Bruises come in all sizes, from a tiny bruise on a toe to a bruise covering large parts of the child's body. Bruises usually are painful for at least the first 2 days after the injury. Bruises are common in children, especially active children.

APPROACH AND GOALS

Massage and hydrotherapy can soothe a bruised area, reduce muscle tightness caused by pain, and promote good circulation to help the bruise heal. If the child's bruise is part of a major injury, massage in a larger area may be indicated to reduce muscle tension and enhance healing. If a child has bruises from falling off a bicycle and also has a wrenched knee and sore back muscles, massage should be done both above and below the bruise. Massage could then be used to address the other sore areas.

MASSAGE AND HYDROTHERAPY FOR BRUISES

ICE APPLICATIONS

Ice should be applied as soon after an injury as possible. Apply an ice pack for 15 minutes and then remove it for 15 minutes; repeat this sequence several times. Bruises on small areas, such as fingers and toes, can be placed in a container of ice water (containing ice cubes). Heat should not be used for the first 24 hours. Ice massage can be performed around the bruise; use extra caution to not press on sore or sensitive areas.

CONTRAST TREATMENT

- Step 1. Dip a washcloth or small bath towel in hot water, then wring it out. Mold the towel over the bruised area for 3 minutes. A moist heating pad or Hydrocollator pack may also be used.
- Step 2. Replace the hot application with another washcloth or small bath towel, which has been wrung out in ice water, for 1 minute. An ice pack may also be used. Repeat twice.

MASSAGE SEQUENCE FOR BRUISES

- Step 1. Basic relaxation sequence.
- Step 2. Effleurage around the bruise. Begin by stroking gently around the bruise. It is critical that the child does not experience any pain. The combination of pain from the injury and pain from massage creates muscular guarding and fear of touch. Use your palms (or fingertips, if the area is small) and alternate your hands. Stroke toward the heart. Begin with gentle pressure and, as the circulation improves and the area becomes more relaxed, deeper pressure may be used, as long as the child is not experiencing pain. Continue for approximately 5 minutes.



Do not apply massage or hydrotherapy to a bruised area unless the cause of the bruise is known. The child's physician should be consulted about bruises developing without obvious cause because this could be a sign of a serious health problem, such as leukemia or a blood clotting disorder.

BURNS

I am aware that I like touching friends more than I like being touched. That's related, I'm sure, to a severe childhood burn that meant I was constantly handled as my painful injury was treated and bandaged. . . . I care very much about touch, but I don't like being massaged.¹

—Helen Colton, family therapist

Fire is the fourth leading cause of accidental death in the United States, and the leading cause of death for children ages 1 to 4. Approximately 100 children die in the United States each year from fires and burns and about 5,000 more are seriously injured. House fires and scaldings are the two leading causes of pediatric burn injuries. Young children have trouble escaping a house that is on fire and scaldings occur when children spill something hot or jump in a bathtub of very hot water. It takes only seconds for water at 125° F or higher to cause a severe burn to their tender skin.² Sadly, up to 10% of burns in children are a result of abuse by adults.³ As children get older, they are generally more at risk of fire injuries because they engage in more high-risk behavior. Boys are at higher risk than girls, partly because they are more likely to play with fire.²

Because a severe burn destroys both the dermis and the epidermis, which does not grow back, skin grafts must be performed.² Contractures and scarring of skin may occur around joints. Major burns are painful, sometimes excruciatingly so, and the child may experience pain for extended periods. Children with serious burns may have multiple challenges, including the stress and pain of the original injury; painful medical procedures, such as debridement and dressing changes; painful scars; postoperative discomfort; and, possibly, physical disability. Children not only experience pain, but lack control over much of their care. Changes in their appearance or ability to function may cause even more stress. While it is important for children to reenter school as soon as possible, teasing and name-calling frequently occur. Insomnia, anxiety, and depression are common responses.

APPROACH AND GOALS

Massage can be soothing and healing for severely burned children. It helps improve their self-image, which suffers greatly from the disfiguring effect of burns. It helps them become more trusting of touch, which they may have learned to associate with pain. It gradually softens scar tissue fibers that restrict muscle and fascia, helping them feel less tight and increasing their range of motion. If the child's parents are taught to massage their children, it helps them become more comfortable with their child's changed body, as well. Emphasizing relaxation skills helps the children learn to have a measure of control over their response to pain. Pediatric psychiatrists Karen Olness and David Cohen use medical hypnosis to help children learn to control their pain responses and to facilitate their healing; they even use medical hypnosis for anesthesia during surgery.⁴

Three studies at the Touch Research Institute explored the use of massage therapy with adult and

pediatric burn survivors. In the first study, simple pressure stroking given to adults before debridement decreased their depression and anger and lowered their pulse and cortisol levels, compared with those who were not stroked. They appeared less anxious and also reported less pain.⁵ Adult burn patients in the second study were randomly assigned to a massage therapy group or a standard treatment control group at the beginning of the scar formation stage. The massage group received 30 minutes of massage with cocoa butter, twice a week for 5 weeks; the other group did not receive massage. The massage therapy group patients had more positive self-reports on their levels of anxiety, depression, pain, and itching immediately after the first and last therapy sessions and their ratings on these measures improved over the 5-week period.⁶ Finally, the third study found that young children who were burn victims showed less distress during painful dressing changes after a 15-minute massage than children who did not receive the massage therapy.⁷

The author has treated children who were in excruciating pain from recent burns. They were receiving physical therapy to maintain range of motion that, although necessary, was excruciatingly painful. Swedish massage on the nonburned areas gave the children significant release from the extreme stress they experienced, not only from the injury itself, but also from the stress and pain of their rehabilitation. When the burns are healed, massage can release tension, soften scar tissue, and help the children feel that their bodies are more like normal. Whole-body massage is important in order to integrate burned areas into the child's body image. It is beneficial to regularly incorporate passive range-of-motion exercises into every massage treatment to prevent contractures and to teach the child to release tension around the joints.

Massage can also rehabilitate badly burned hands. If there is hypersensitivity (pain with any moderate stimulation), the area can be massaged using progressively more pressure as the hand becomes less sensitive. If there are scar tissue bands at the web spaces or on the palm, use circular fingertip massage applied perpendicular to the scar bands, using firm pressure. Also, stretch the skin to increase its surface area.

MESSAGE SEQUENCE FOR BURNS

MESSAGE SEQUENCE FOR ANY PART OF THE BODY, LASTING NO MORE THAN 10 MINUTES

- Step 1. Basic relaxation sequence.
- Step 2. Apply cocoa butter or vitamin E oil to help keep scar tissue soft.
- Step 3. Perform superficial effleurage, moving slowly and gently. Move from distal to proximal (stroking

toward the heart). This allows any edema to be readily absorbed by muscle tissue, rather than lodging in areas that have little muscle tissue and, therefore, lack circulation. Repeat for about 5 minutes.

- Step 4. Pick the skin up gently and roll it between your thumb and fingers, as in pincement, only slowly. Never cause pain! If the burned areas are massaged regularly, over time, the child's tolerance for pressure will increase. Repeat for 1 to 2 minutes.
- Step 5. Use deeper pressure. Using the bones as a guide, glide over areas while pressing with your fingertips. For example, if you are massaging the forearm, use the thumb and fingers to stroke along the radius and ulna from elbow to wrist.
- Step 6. Perform superficial effleurage for 1 minute.
- Step 7. When the burned area is on a limb, perform passive range-of-motion exercises on the entire extremity.



Massage should not be done too soon after a burn occurs. Check with the child's physician or physical therapist to find out when it is safe to begin. However, massage unburned parts of the body at any time to accustom the child to massage and to help him learn to relax.

DISLOCATIONS

A dislocation is a disruption in the normal relationship of the bones that form a joint; so much force is applied to the joint that the bones separate from their articulation. A dislocation is not only a disruption of the joint capsule and its ligaments, it may also be associated with a wide variety of other injuries, including the tearing of the joint capsule, the stretching or rupture of collateral ligaments, and the stripping of the periosteum from the bone. Muscles, blood vessels, and nerves may also be torn. Children's soft tissue attachments are more lax than those of adults and their joint mobility is greater, making the joints the point of least resistance when parts of their bodies are subjected to trauma. Certain conditions, such as true hypermobility and Down syndrome, may also predispose them to dislocations.

Children dislocate their elbows more frequently than any other joint, most often when they fall on an outstretched hand with the elbow incompletely flexed.¹ Another common pediatric dislocation is an anterior dislocation of the head of the humerus, which can occur in football, skiing, and wrestling. Typically, the force applied to the joint not only displaces the head of the humerus under the coracoid process, but it also tears the anterior capsule of the shoulder joint and stretches the subscapularis and supraspinatus muscles.

The standard medical treatment for a dislocation begins with a careful evaluation of the injury. Because it takes so much force to cause a dislocation, there may also be fractures or other soft tissue injuries. Second, a reduction of the dislocation—putting the bones back in the normal position—is critical. Because dislocations and reductions can be painful, children may receive pain medication when the dislocation is reduced. Third, some degree of immobilization is almost always necessary while the ligaments heal. Depending on the joint and the extent of the injury, this could mean bed rest, traction, or simply wearing a splint or cast. For long-term instability, **prolotherapy** may be helpful, or surgery may be performed to shorten the ligaments.

The treatment for the two previously mentioned pediatric dislocations is as follows: For an elbow dislocation, swelling begins immediately and, if the joint is not reduced within approximately 15 minutes, there will be so much swelling, muscle spasm, and pain that an anesthetic will be needed during the reduction. (If a dislocated elbow joint is not reduced, there will be some type of soft tissue contracture within a few weeks, such as in the triceps, from the elbow being held in extension. If it is not reduced within several months or longer, the distal humerus, proximal radius, and proximal ulna may become progressively deformed.)¹ So the physician will first reduce the dislocation, then check for associated injuries (fracture of the medial epicondyle is common), and then prescribe immobilization, typically some type of splinting. This will be used for a few weeks until the ligaments are able to keep the joint in place. Elbow range-of-motion exercises should begin after 2 weeks, to minimize the risk of contracture and to eliminate stiffness. When damage to the joint capsule and surrounding ligament is too extreme and the ligaments will not support the joint, it is sometimes necessary to shorten them surgically.

An anterior shoulder dislocation will also be reduced as soon as possible, and the affected arm will be immobilized in a sling for approximately 3 weeks. Muscle strengthening exercises should begin as soon as the child's arm is out of the sling and range-of-motion exercises should begin as soon as the child is free of pain. Unfortunately, 60–85% of children have repeated dislocations within 2 years because their ligaments are not able to adequately support the joint.²

APPROACH AND GOALS

Massage will not strengthen the ligaments or the joint capsule and is contraindicated in the acute stage of healing. However, contrast treatments well above (proximal to) the injury can improve circulation and comfort in the acute stage. Hydrotherapy to the oppo-

site limb can improve circulation in the immobilized limb by causing a reflex vasodilation.³ Gentle Swedish massage can be done to enhance the circulation and relax the surrounding areas, although the dislocated joint should not be moved in any way.

Once the immobilization is removed, contrast treatments can be used directly over the dislocated joint to improve circulation. Also at this time, massage can be used for preventing muscular guarding in the area, treating trigger points, and releasing any fascial restriction or contractures caused by prolonged immobilization. It can also prevent scar tissue in the soft tissue around the joint and dramatically improve blood and lymph circulation.

MASSAGE AND HYDROTHERAPY FOR ELBOW DISLOCATIONS

The elbow is used as an example because it is the most common pediatric dislocation; however, these treatments may be used with any joint.

CONTRAST TREATMENT—ACUTE PHASE

Do not apply hydrotherapy on or near the injured elbow. A contrast treatment may be done on the same shoulder, which will improve the circulation proximal to the elbow. A contrast treatment with heat and ice may also be done on the noninjured elbow, using heat and ice to cause a reflex vasodilation.

Positioning: Have the child lay supine and completely support the injured elbow with pillows.

- Step 1. Apply moist heat to the shoulder for 3 minutes.
- Step 2. Apply an ice pack or perform ice massage on the shoulder for 1 minute.
- Step 3. Repeat Steps 1 and 2.
- Step 4. Repeat Steps 1 and 2, for a total of three changes.

CONTRAST TREATMENT—FOLLOWING ACUTE PHASE

Positioning: Have the child lay supine and completely support the injured elbow with pillows.

- Step 1. Apply moist heat to the elbow for 3 minutes.
- Step 2. Apply an ice pack or perform ice massage on the elbow for 1 minute.
- Step 3. Repeat Steps 1 and 2.
- Step 4. Repeat Steps 1 and 2, for a total of three changes.

MASSAGE SEQUENCE FOR DISLOCATIONS

- Step 1. Basic relaxation sequence and passive touch over the dislocated joint.
- Step 2. Apply oil or lotion.

- Step 3. Effleurage above and below the dislocated joint. Begin stroking gently above and below the joint. Use your palms (or fingertips, if the area is small) and alternate hands. Stroke upward toward the heart. For a dislocated elbow, stroke up the forearm to the top of the humerus, then use your fingertips to stroke from fingers to wrist. Repeat for 5 minutes.
- Step 4. Thumbstroke over the dislocated joint. Be extremely gentle. Make short strokes toward the heart. Massage the dislocated area and a few inches around it. Feel for scar tissue, muscle tension, and trigger points. If the child can tolerate deeper pressure without pain, deeper pressure may be applied after 2 to 3 minutes. Repeat for 2 to 5 minutes.
- Step 5. Repeat Step 3.



Consult with the child's physician before performing any range-of-motion exercises.

FRACTURES

Bone is generally thought of as a solid and static structure; in reality, it is a dynamic and responsive tissue. Especially in children, bones change in response to the individual's age, nutrition, general health, and level of activity (see Point of Interest Box 4–3). Emotional deprivation can even affect bone growth, as in the case of the children with growth retardation discussed in Chapter 1. During fetal life, the entire skeleton is formed of cartilage and consists of 330 separate bones. **Ossification** of the bones actually begins in utero, but is not complete until about age 25, when peak bone mass is reached. Even when the individual has reached full skeletal growth, bone is still a dynamic tissue that receives 5% of the body's total blood supply to meet its metabolic needs.¹⁻³

The long bones of the body include the bones of the arms, hands, legs, and feet. During childhood, they grow from the shaft (diaphysis) out to the ends (epiphysis). At birth, the diaphyses are separate from the epiphyses. Growth occurs at the epiphyses, where new bone cells are made at a growth plate, an area of rapidly proliferating cells. Pediatric bone growth is amazingly rapid compared with that of an adult; for example, between birth and age 4, the spine, femurs, tibiae, and the bones of the arm and hand nearly double in length. Between the ages of 14 and 20, children reach full bone growth, the growth plates stop making new cells, the diaphyses fuse with the epiphyses, and the skeleton now consists of only 206 separate bones.

A fracture is any type of break in a bone. This term includes a range of damage to bones, from small



POINT OF INTEREST BOX 4-3

Bones Respond to Stress

Bones grow according to the demands placed upon them. For example, children with spastic cerebral palsy, whose muscles are constantly contracting, have strong bones due to the constant stimulation their bones receive from their muscles. So do athletic children. When children with hemophilia have bleeds into their joints, the hyperemia stimulates bone growth. This can lead to leg length differences as one bone grows more than the other, as well as to bony enlargements of the joints.¹ Joint inflammation in juvenile rheumatoid arthritis can cause bone growth for the same reason. Children with **hydrocephalus** may have enlarged cranial bones, because the bones grow to accommodate the greater volume of fluid around the brain.

Absence of active movement in the limbs due to muscle weakness (from such conditions as muscular dystrophy, floppy cerebral palsy, or polio or simply being in a wheelchair all day) can result in the opposite effect—weak bones caused by lack of stimulation. In one group of children with polio who had broken bones, 57 of 62 fractures were in severely paralyzed limbs and only five were in the children's nonparalyzed limbs. The most common cause of the fractures was having the paralyzed limb immobilized in a plaster cast to correct contractures, and losing bone strength while the limb was not used. A leg bone that is in a cast can become 30% decalcified within a few weeks.²

References

1. Anderson A, Hotzan T, Masley J: *Physical Therapy in Bleeding Disorders*. National Hemophilia Foundation booklet, 2000, p 9
2. Ogden J: *Skeletal Injury in the Child*. Philadelphia, PA: Lea and Febiger, 1982, p 183

cracks to complete breaks to thorough bone shattering. How badly a bone and its surrounding soft tissues are damaged depends on the force of the impact that caused the fracture. A force that just barely exceeds the bone's breaking point may crack the bone; with more force, it may break all the way through; and with extreme force, the bone may shatter.

Most children break at least one bone before reaching adulthood. Because they are not completely ossified, children's bones are more porous than adult bones. Fractures are more common in childhood compared with ligament injuries and dislocations, which are more common in adulthood. Fortunately, pediatric bones grow back together more rapidly than adult bones. The younger the child, the more rapid the healing. For example, a femur fracture may

heal in only 3 weeks in an infant, whereas 20 weeks is typical for an adult.

Point of Interest Box 4-4 identifies the bones most commonly fractured in children. Because the diaphysis and epiphysis are not yet fused, the growth plate may be the weakest point (or the point of least resistance) when a child suffers an impact. In fact, 15% of all pediatric fractures involve the growth plate. This can be a serious situation because, if the rapid cell proliferation at the growth plate is disturbed by injury, bone growth may be permanently halted. This can lead to a deformity of the bone, or a bone that is shorter than it would have been otherwise. This



POINT OF INTEREST BOX 4-4

Which Bones Are Children Most Likely to Break?

If you are giving massages to children, you will more likely treat some types of fractures more than others¹; for example:

- Boys of all ages have more fractures than girls of the same age because they engage in more reckless and dangerous activities.
- During childhood, upper limb fractures are seven times more common than lower limb fractures. Clavicular fractures are common throughout childhood. Forearm and wrist fractures comprise 30–50% of all fractures. The rate of forearm fracture numbers increases progressively with age through the middle-school years, when it begins to decrease. The radius is the most frequently fractured bone. Complications of forearm fractures involve refracture; decreased forearm rotation; and synostosis, the growth of new bone between the radius and ulna.
- The majority of hand injuries result from crushing injuries in infancy or from sports injuries in adolescence.
- Pelvic fractures are rare. The immature pelvis is more malleable than that of an adult because a greater percentage of pelvis is still cartilage and pelvic joints are more flexible.
- Spinal, femur, ankle, and foot fractures are also uncommon, accounting for perhaps 15% of all childhood fractures.
- Tibial fractures account for 10–15% of all fractures. Most stress fractures in adolescents, which occur in the proximal third of the tibia, are associated with endurance running.

References

1. Morrissy R: *Lovell and Winter's Pediatric Orthopaedics*. Vol. 2. Baltimore, MD: Lippincott Williams & Wilkins, p 1355-1411, 2001

abnormality of the bone may have permanent consequences. For example, a fracture of the femur at the growth plate could cause it to be shorter and lead to leg length inequality, which can be a serious condition. A leg that is shorter on one side of the body than the other can lead to a tilted pelvis when standing; compensatory scoliosis; activation of trigger points in hip, torso, and neck muscles; and chronic back pain.³⁻⁵

As an adolescent approaches skeletal maturity, the bones become denser (more calcified) and the epiphyses fuse with the diaphyses. Hereafter, ligaments and musculotendinous structures will be more vulnerable to injury than bone and trauma will be transmitted through the soft tissue instead.

Fractures are treated in different ways, depending on their severity and location. As soon as possible after the injury occurs, the bone is splinted to prevent further damage and to prevent the cut ends from damaging blood vessels, nerves, and other tissue surrounding the bone. The muscles surrounding the fracture spasm as a result of the pain the child feels from the broken edges of the bone. Fractures are most often immobilized by applying casts; however, braces or rods, plates, and pins or screws may be necessary to hold the bone ends together. As new bone cells and calcium are deposited between the ends of the broken bones, they knit back together. Often, the bone heals so well that the healed fracture leaves the bone stronger than it was before the injury. In response to the injury, the child's bone will grow at an accelerated rate for 6 to 8 months.

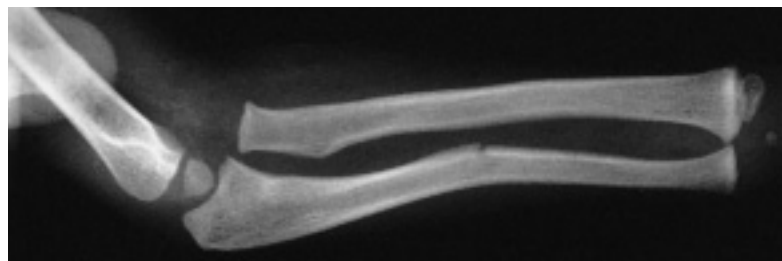
When a cast is removed, the muscles around the break are usually weak. For each week of immobilization, it takes about 6 weeks of active use before the muscles regain full strength. There may be edema and poor circulation, as well. As children begin to use the body part again, they will actively move it through its normal range of motion and soft tissue and muscle strength will become normal. However, when a force sufficient to break a bone has been applied to an area, there may be lasting effects on the surrounding soft tissue (see Figure 4-2). These may include:

1. Stretching or tearing of surrounding muscles, tendons, or fascial sheaths.
2. Avulsion of the periosteum or stripping of the periosteum away from the bone.
3. Overstretching or complete tearing of the ligaments from the bone.
4. Tearing of cartilage.
5. Excess scar tissue, with possible permanent effects. For example, the condylar neck of the mandible is a relatively common place for a child to fracture, resulting from an injury such as a bicycle accident. If the fracture heals with extensive scar tissue and restriction, the mandible will not be able to grow down and forward as usual and one side of the mandible may not grow as much as the other side.⁶
6. Activation of trigger points in fascia, muscles, ligaments, and even in the periosteum. Trigger points in the muscles around the fracture site may be caused by stretching, tearing, or bruising, the instinctive contraction of muscles to splint a hurt area, or by reaction to the pain of the fracture. Short-term trigger points in the areas around a fracture will contribute to pain, swelling, and slow healing as a result of poor nutrition to the fracture site.⁷

The following are examples of trigger points subsequent to injury: Fracture of the proximal humerus can activate trigger points in the subscapularis; fracture of the upper ribs may activate trigger points in the pectoralis minor; an accident that causes a fracture of the ankle or leg may initiate or activate trigger points in the gastrocnemius and/or quadratus lumborum muscles; stress fractures of the tibia and fibula, usually associated with endurance running in adolescents, can activate trigger points in the extensor digitorum longus, extensor hallucis longus, and superficial and deep intrinsic foot muscles; and fractures of the small bones of the feet can activate trigger points in the intrinsic foot muscles.^{3,4}

Immobilization of the fracture may also contribute to the development of trigger points. For example, immobilization of the arm in a sling or cast in an adducted position may initiate trigger points in the pectoralis major.³ A walking cast, used for ankle or leg fractures, fixes the ankle and immobilizes and

FIGURE 4-2 ■ The force that caused this child's ulnar fracture also caused an anterior dislocation of the radial head. Reprinted with permission from Morrissy R. Lovell and Winter's *Pediatric Orthopaedics*. Vol. 2. Baltimore, MD: Lippincott Williams & Wilkins, 2001, p 1357.



deconditions the gastrocnemius muscle, which promotes the development of trigger points. Immobilization after stress fractures of the tibia and fibula can activate trigger points in the extensor digitorum longus and extensor hallucis longus.⁴

APPROACH AND GOALS

After a broken bone has healed and the cast is removed, the muscles around the break are usually stiff and weak. For each week of being immobilized in a cast, it takes about 6 weeks for the muscles to regain their full strength. There may be edema in the tissue around the fracture and the muscles may be sore. Both massage and hydrotherapy can promote circulation to weakened muscles without fatiguing them and reduce muscle tightness and spasm caused by pain; this will help the child regain full movement. Massage helps the area relax, preventing chronic muscular guarding caused by trauma and pain. It also helps give the child a positive body sensation in an area that has had more than its share of negativity. It is important to massage above and below the fracture site, and to check the range of motion of the joints on either side as well. Trigger points and myofascial restriction may also need to be treated with other specific techniques.

MASSAGE AND HYDROTHERAPY FOR FRACTURES

Choose one hydrotherapy treatment to perform prior to massage:

CONTRAST TREATMENT—DURING IMMOBILIZATION

Hydrotherapy of the uninjured area on the opposite side of the body causes reflex vasodilation and may be done while the cast is still on. For example, if the left ankle is in a cast, perform a contrast treatment on the right ankle. Use the standard contrast treatment described in Chapter 3, with three changes of hot and cold.

CONTRAST TREATMENT—AFTER FRACTURE IS HEALED

After the cast has been removed, use a handheld shower attachment to give mechanical stimulation, as well as a circulatory effect.

- Step 1. Spray the area with water for 2 minutes. The water should be as hot as the child can tolerate (about 105° to 110° F).
- Step 2. Spray the area with water as cold as the child can tolerate for 30 seconds.

- Step 3. Repeat twice more, for a total of three changes. This treatment can be done three times daily.

MOIST HEAT APPLICATION

- Step 1. Dip a washcloth or small bath towel in hot water and then wring it out.
- Step 2. Mold the towel over the area of the fracture and leave on for 3 minutes, then replace with another equally hot cloth for 3 minutes.
- Step 3. Alternate washcloths for 9 to 12 minutes. Moist heat pads or Hydrocollator packs may also be used.
- Step 4. Rub the area briefly with a washcloth wrung out in ice water or immerse the body part in a container of cold water for 10 seconds.

WATER EXERCISE

For clavicle, scapula, ribs, spine, pelvis, thigh, and upper arm fractures, use a full-body whirlpool and exercise the area underwater, at a temperature of about 94° F or warmer if tolerated. The water does not need to be as warm as for a hot bath because the child will be exercising and producing body heat.

MASSAGE DURING IMMOBILIZATION

Massage may be done above and below a cast, which decreases pain and swelling as it improves circulation. For a fracture of the tibia, for example, use effleurage and petrissage to massage above the knee to the top of the thigh and below the cast to the tips of the toes. This may be done as often as three times a day until the cast is removed. Massage of the opposite side causes a reflex vasodilation in the area of the fracture.

MASSAGE SEQUENCE FOR FRACTURES—AFTER HEALING

After the child's cast is removed, massage may be done one to three times every day. Do not cause the child any pain or discomfort!

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Passive touch over the fracture site.
- Step 3. Apply oil or lotion.
- Step 4. Gentle effleurage around the fracture site. Use your palms (or fingertips if the area is small) and alternate hands. Stroke upward toward the heart. If the fracture site is not sensitive, you may begin to stroke it gently. After 1 to 2 minutes, you may use more pressure, always working at the child's tolerance level. Effleurage for approximately 2 minutes.
- Step 5. Thumbstroke around the fracture site. Stroke toward the heart. Cover the fracture site and a few



CASE STUDY 4-1

Background

Rosita is an 18-year-old girl who was injured in a fall off a cliff when she was 11 years old. Her fall fractured her T10 vertebrae and at least five ribs. Her back was surgically fused from T10 to L5. Rosita lived at home and used a wheelchair for mobility; she developed serious pressure ulcers and went to a clinic for children with disabilities to have the pressure ulcers treated. She had been in a lying-down wheelchair at the clinic for 7 months until returning to sitting in a wheelchair 3 days ago. Following her spinal cord injury, she has been in constant pain in her entire back and has pain in the area of the fractured ribs each time she inhales. After 3 days in a wheelchair, she is suffering from pain in her arms and increased pain in her lower back as she adjusts to a sitting position.

Impression

Pain secondary to vertebral fracture, rib fracture, injury of her spinal cord, and secondary compensations for restricted movement due to vertebral fusion. Recent pain due to muscular soreness. Chronic high stress level.

Treatment

Rosita transferred, with help, from her wheelchair to the treatment table. Shy and rather modest, she was treated with her tank top on and shirt and brassiere pulled up. A sheet was tucked into her underwear and her lower back was uncovered down to her gluteal cleft, leaving most of her back exposed. Superficial effleurage of the entire exposed back was used initially to evaluate her tissue. When her back was palpated, extreme tension was felt in her erector and intercostal muscles, as well as scar tissue around her fractured ribs; she had virtually no flexibility in her back. She reacted to the massage so happily that it was clear she was hungry for safe, nurturing touch, and that simple superficial effleurage was deeply comforting, both emotionally and physically. Her first 30-minute treatment consisted of this one stroke on her back. No effort was

made to use deeper pressure or a variety of strokes because she appeared so content. Rosita returned 2 days later and indicated that her back pain had been much reduced and that she was breathing with less pain. The next session again consisted of superficial effleurage of the back, with gradually deepening pressure. As this was well tolerated, thumbstroking was done around the scar tissue in the rib area, as well as stroking (raking) between the ribs to reduce the tension in her intercostal muscles. Abdominal effleurage was performed with her in the supine position, fully dressed and with only her abdomen exposed. The abdominal effleurage emphasized the abdominal muscles on the underside of her ribcage to release tension around the bottom ribs.

Rosita returned 2 days later for her third session full of enthusiasm and indicated that her back and rib pain were still further reduced. Her next three sessions were similar to the first two. At the end of her fifth session, her back and rib pain continued to be reduced, and she was able to breathe much deeper than before and with less pain. This concluded her treatment. Due to the severity of her injuries, the many years she had spent in a wheelchair, and her obvious hunger for nurturing touch, she would have benefited from more treatment. Once her muscle tension was further reduced and restricting scar tissue softened further, attention could have been directed to reducing muscle tension in other parts of her body and increasing her joint range of motion. However, her initial treatment was directed toward treating the soft-tissue effects of her spinal and rib fractures.

Discussion Questions

1. What tissues were injured or affected by Rosita's spinal cord injury?
2. What symptoms were present?
3. What other areas of Rosita's body were affected by her spinal cord injury?
4. How were Rosita's personal boundaries respected during her treatment?

inches around it. Use medium pressure. Thumbstroke for 2 minutes.

Step 6. Effleurage above and below the fracture site. Use your palms and massage farther away from the fracture site. For example, if the elbow was fractured, massage the entire upper arm, as well as the forearm and hand. Use medium pressure; massage for 2 or 3 minutes.

Step 7. Range-of-motion exercises for the joints above and below the fracture site.

Step 8. Basic relaxation sequence.

SCAR TISSUE

Scar tissue is an accumulation of collagen fibers that replaces damaged tissue at the site of an injury. Although scar tissue can present problems after a wound or burn has healed, the scar formation process, in which the body knits skin and fascia, is both sophisticated and complex. Wound-healing mechanisms include an increased number of fibroblast cells that form scar tissue and increased levels of the enzymes necessary for healing. These are in place about 7 to 10

days after an injury or surgical incision. Collagen fibers, which are denser than normal tissue, form 1 to 6 weeks after the injury; they orient around the injury and grow together, forming a thick, firm scar. Unfortunately, collagen growth across an injured area is random, without grain or definite orientation.

During a 1-year period, the enzyme collagenase digests extra collagen in the area of the scar, and scars begin to soften and fade somewhat. At that time, the scar is probably as soft as it will become by itself.

Problems with scar tissue include:

- Fibrous tissue can form adhesions from the skin to many layers of tissue below, preventing free movement of the area. Fascial layers must slide on each other for tissue to have the greatest possible degree of motion.
- Scars can feel uncomfortable, tight, and restricting. During growth spurts, the surrounding tissue expands and the scar does not; this may cause the child pain.
- Circulation may be poor around the scar.
- Trigger points in scar tissue can refer burning, prickling, or lightning-like jabs of pain to adjacent tissue.¹
- Certain scars may contribute significantly to craniosacral dysfunction.²

APPROACH AND GOALS

Moist heat can relax the area around the scar and temporarily soften the scar tissue in preparation for massage.

Two types of massage are presented in this section. The first type is vitamin E application to the scar. The author has observed extensive scars that healed virtually without a trace when this regimen was followed. Vitamin E application may need to be repeated for up to 6 months. Another benefit of this application is that, when the child applies the oil and repeatedly touches the scar, the scar comes to feel more like a part of the child. This is important because, after surgery, the scar is typically sore or numb and has a red-dish appearance that seems foreign to the child.

The second massage technique is to soften the scar tissue by breaking adhesions and loosening restricting fibers. The sooner the scar is treated with scar-tissue massage, the easier and more thorough the freedom of tissue movement and function. Massage also has an affirming quality, which helps the child incorporate the scar into his body image, rather than seeing it as ugly or foreign.

Scar tissue work may be painful for a child. The need to treat restriction in and around scars must be weighed against the need to prevent massage from being a negative experience for a child. Cross-fiber

friction, a classic technique for scar tissue and adhesions, is generally done with, against, and diagonal to the direction of a scar. Deep friction helps break adhesions between fibers by forcibly broadening the tissue, producing a more parallel fiber arrangement. However, cross-fiber friction can be excruciatingly painful. If there is a pressing need to work with the scar and pain may be involved, the child, the parent, and the therapist should agree whether or not to proceed. The scar might possibly be painful after massage; if so, the child may be treated every second or third day. An ideal solution would be to have the massage therapist treat the child once a week and have the parent massage the child in between sessions. During a 30- or 60-minute session, you might try massaging the scar for 10 minutes, massaging other areas of the child for some time, then massaging the scar again for 10 minutes. The child's tolerance for massage around the scar should be the deciding factor.

MASSAGE AND HYDROTHERAPY FOR SCAR TISSUE

MOIST HEAT APPLICATION

Use heat before massaging scar tissue to soften the scar tissue.

- Step 1. Apply a hot water bottle, moist heating pad, or Hydrocollator pack to the area for 10 minutes.
- Step 2. Perform massage.

VITAMIN E OIL MASSAGE

The child or the parent can do this technique 2 weeks after surgery. This is not truly a massage technique, but an application of the vitamin E in the oil.

- Step 1. Apply vitamin E oil to the scar.
- Step 2. Rub oil gently into the scar for 1 minute, twice daily. Almost no pressure is used.
- Step 3. Use gentle fingertip pressure and move the fingers in tiny circles over the scar.

MASSAGE SEQUENCE FOR SCAR TISSUE

This technique is particularly appropriate to teach to parents because the child may require only minutes a day of massage over a period of weeks. Massage may be done every day for 10 to 15 minutes. Although it may be tempting to begin massage sooner, it should begin no sooner than 6 weeks following the injury.

- Step 1. Basic relaxation sequence.
- Step 2. Apply oil or lotion.
- Step 3. Begin by gently mobilizing the scar. With your fingertips, gently move the skin back and forth over

the underlying tissue. This gives you a “feel” for the amount of restriction or fibrous adhesions between the skin and the underlying tissue.

- Step 4. Effleurage over the scar and a few inches around it by stroking with your palms (or fingertips, if the area is small). Stroke in the direction that the scar runs and at right angles. Do this for 2 minutes.
- Step 5. Thumbstroke directly over the scar tissue, using as much pressure as the child can tolerate. Stroke in the direction that the scar tissue runs, diagonal to the scar, and at right angles to it, as well. Try to stretch the tissue between your thumbs. Repeat for 2 minutes.
- Step 6. Effleurage over and around the scar tissue. Repeat for 2 minutes.
- Step 7. Repeat thumbstroking directly over the scar tissue for 2 minutes.
- Step 8. Gently mobilize the superficial tissue again, moving the skin back and forth over the deeper tissue. Teach the child to mobilize the scar tissue, as well. By feeling the scar and the tissue under it, the child can more readily accept the scar as part of himself.
- Step 9. Stroke the area very lightly with your fingertips.
- Step 10. Basic relaxation sequence.



Scars may have layers of stitches, not just the stitches that can be seen; it may not be possible for you to ascertain the full extent of healing. If there is any question about when to treat a scar, consult the child's physician.

SPINAL CORD INJURIES

Almost all spinal cord injuries (SCIs) are caused by car accidents, falls, or violence (see Figure 4-3). Eighty-two percent of these injuries occur to males between the ages of 16 and 30.¹ In younger children, SCIs can also be caused by athletic injuries, abuse, or breech deliveries.² Spinal cord injury is less frequent in children than in adults because their spines are more flexible, allowing a greater deformation without fracture and a force to be dissipated over a larger number of segments. Should children be exposed to a great deal of force, their disproportionately large head size and other structural features make their cervical and upper spine at greatest risk for SCI. Trauma to the lower back rarely causes SCIs in children.^{1,2} When trauma does occur, the spinal cord may be torn, bruised, or severed. When the cord is damaged, sensation and controlled movement may be partially or completely lost below the level of injury. Thirty-five percent of SCIs also involve some degree of brain injury and, possibly, other soft tissue injuries; 50% of children who have spinal fractures resulting from motor vehicle accidents have other associated injuries.³

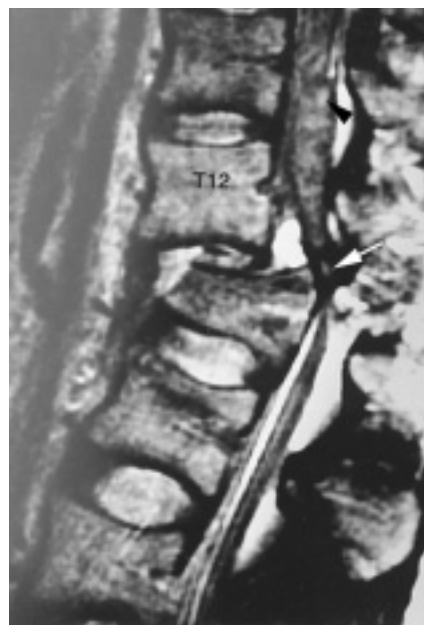


FIGURE 4-3 ■ Radiograph of Spinal Cord Injury. A crushing blow caused this injury. Note the compression of the cord caused by the posterior displacement of the first lumbar vertebrae. Reprinted with permission from Werner R: *A Massage Therapist's Guide to Pathology*. Ed. 2. Baltimore, MD: Lippincott Williams & Wilkins, 2002, p 213.

Common problems associated with SCIs include:

- **Pain:** pain is so severe among 40% of those with SCIs that it interferes with their daily routines.³
- Contractures and curvatures of the spine develop from spasticity or from the child's position in a wheelchair.
- Pressure ulcers can occur in body areas where sensation is lost (Chapter 6, page 191).
- Urinary infections are common in children who must use a catheter to urinate.
- Decalcification of the leg bones is possible because they are thin and weak from lack of exercise.
- Body temperature is difficult to control in hot weather.

APPROACH AND GOALS

Hydrotherapy can help prepare a child's tissue for massage; application of moist heat can relax muscles and increase local circulation. Muscle strength may be temporarily stimulated with hydrotherapy, allowing the child to do muscle strengthening exercises (see Muscle Weakness section, page 142).

Swedish massage has many benefits for the spinal cord injured child, including:

- a sense of body wholeness
- deeper breathing

- stimulation and increased circulation to paralyzed areas, helping to prevent atrophy
- prevention of edema
- less discomfort in the area of the spinal injury and/or a halo brace
- relief of muscle fatigue and strain caused by vigorous physical therapy
- relief of back pain caused by sitting in a wheelchair for long periods, as well as from pain caused by using upper body muscles to transfer from wheelchair to bed and back
- more supple muscle and connective tissue, helping to prevent contracture
- relief of muscle spasms in the legs
- maintenance of joint range of motion
- relief of constipation

A Touch Research Institute study compared the effects of massage and exercise with adults with SCIs at levels C5 to C7. Participants were given either a 40-minute Swedish massage, twice weekly for 5 weeks, or they performed an exercise routine, also twice weekly for 5 weeks. At the end of the study, the massage therapy group had greater muscle strength and range of motion than the exercise group and lower scores on anxiety and depression tests.⁴ Although Swedish massage is highly beneficial for those with SCIs, other bodywork modalities may also be used at the same time, such as myofascial release and craniosacral therapy.⁵ Massage therapists, including Patty Tipton-Sproul (therapist for the Seattle Seahawks football team) and Dr. Meir Schneider, have had good success with adults with SCIs when therapy began soon after the injury—even the next day—with physician approval (Tipton-Spradlin P, interview: Seattle, WA, May 2000).⁶

Larry Burns-Vidlak, a massage therapist who specializes in massage for the disabled, has massaged children with SCIs as young as age 2. He believes that the child's muscles, tendons, ligaments, and connective tissue need deep massage; however, he cautions that massage should only be done to the child's tolerance. If there is a painful area, use light pressure at first. Gradually, after a number of treatments, deeper massage will be tolerated (Burns-Vidlak L, personal communication, October 1992).

A daily massage of the entire body is ideal, using the Swedish massage techniques described in Chapter 3. Because parts of the body not directly affected by the SCI are likely to compensate for injured areas, they may be overworked and can become tense, stiff, sore, or uncomfortable. Parents should be taught to massage their children. Whenever the child is rolled over or moved, the parents should massage any areas that have been under pressure. However, they should not rub any areas with early signs of pressure ulcers, such as swelling, darkness, redness, or open skin (Chapter 6).

Despite having similar injuries, each child with an SCI is an individual with different concerns and different needs. When the child's medical history is being taken, be sure to find out what her greatest physical discomfort or concern is.

MASSAGE AND HYDROTHERAPY FOR SCIS

MOIST HEAT APPLICATION

Apply a moist hot pack or Hydrocollator pack for 10 minutes before massaging an area. Then, while that area is being massaged, apply it to the next part of the body that will be massaged. Use caution if an area is numb. Carefully monitor the area under the heat, so that the child's skin does not burn.

COLD WATER IMMERSION AND EXERCISE

See Muscle Weakness section in Chapter 5, page 142.

MASSAGE FOR SPECIFIC BODY AREAS OF THE CHILD WITH SCI

As stated earlier, a daily whole-body massage is ideal, using the Swedish massage techniques described in Chapter 3. Use the basic relaxation sequence to encourage deep breathing. Then ask the child to imagine that the area being massaged expands on inhalation and settles back to its normal size on exhalation. The child should breathe comfortably and without effort. This can help increase sensation in areas where the child has little feeling. Passive range-of-motion exercises are also important.

Neck Massage

If the injury was to the child's cervical vertebrae, his neck may feel strained, stiff, or uncomfortable, especially if the vertebrae were surgically fused. Massage the neck muscles on either side of the spine using the techniques described in Chapter 3 and the section on neck and shoulder tension in Chapter 5. If there is sensitivity or discomfort where a halo brace was in place, use gentle fingertip pressure until it is decreased.

Hand and Forearm Massage

For excessive tension of hands and forearms, use deep kneading, petrissage, and range-of-motion movements of all joints. Some children may have more pain from overusing their upper extremities propelling a wheelchair than from the SCI.

Leg Massage

To relieve muscle spasms in the legs, use the basic leg massage described in Chapter 3, but spend additional time massaging the front of the thigh and the buttock. Use deep

(Continued on page 114)



CASE STUDY 4-2

Background

Alejandro is a 13-year-old boy with a spinal cord injury (SCI) at the T6 level. He is one of 17 teenagers and young adults with SCIs being treated at a Mexican clinic for disabled children. Of those 17, 15 have back pain and discomfort from sitting in wheelchairs all day. Two patients, using lying-down wheelchairs while waiting for pressure ulcers to heal, have severe back discomfort and contractures in various joints from lying down for an extended time. All have poor circulation in their legs. Other than problems associated with the SCIs, nine patients have concerns related to associated injuries, such as fractures or gunshot wounds. All are dealing with the stress of being disabled at a time in their lives when they would normally be at the height of their physical vigor and strength, as well as being poor and disabled in a third-world country—they have an extremely high level of stress. Massage is being used to treat the effects of the SCIs and address pain from associated injuries; however, it is also addressing their touch deprivation and high stress levels.

When Alejandro was age 12, he was shot through the spine. The bullet entered through the right rhomboid area and exited through his left armpit. Soon after the injury, fluid was drained from his chest. He developed deep pressure ulcers (now healed) during his initial hospitalization. He uses a manual wheelchair and attends school. Severe pain in his shoulders and midback often keep him awake at night, probably caused by the combination of the spinal injury and using his arms to propel his chair through the sand and dirt roads of his town and to do transfers. His legs also feel stiff to him.

Impression

Pain secondary to SCI, other tissue injury and muscle strain, all possibly exacerbated by extreme stress.

Treatment

Alejandro transferred from his wheelchair to a treatment table. He began in the prone position, with only his shirt removed. Massage began with light effleurage stroking of the whole back to evaluate his tissue. Because his back was hypersensitive and his rhomboid area was hypersensitive and painful to the touch, only superficial effleurage was attempted for the first two sessions. At the third session, superficial effleurage of the whole back was done initially and, as Alejandro could tolerate it, deeper effleurage strokes of the whole back followed. Because his rhomboid area was so hypersensitive, deeper effleurage was begun around that area by stroking along the sides of the upper back. Range of motion of the shoulder

joints and pulling out of the scapulae to stretch the rhomboids was also done to encourage relaxation of the rhomboid region. Once this was done, superficial effleurage was cautiously followed by deeper effleurage.

As the author was able to palpate underneath the now-warmed superficial layers of tissue, deeper knots were encountered. There was a great deal of scar tissue and marked edema in the tissue around the bullet wound. It was also extremely sensitive. A gentle, but persistent approach, was tried; a variety of Swedish massage strokes, such as kneading and petrissage, were attempted at first around the rhomboid area and then over it. Each stroke began with superficial pressure, but was terminated immediately if not tolerated. Eventually Alejandro was able to tolerate one gentle effleurage stroke at a particular speed and in one particular direction (diagonal to the scar tissue); when this was established, no effort was made to go beyond it for this session. Subsequent sessions were similar, with gradually increasing pressure as tolerated. A variety of Swedish massage strokes were used on the back and later on the chest. Alejandro was seen daily for 8 days.

Response

After the third session, Alejandro reported he generally felt much better and had greatly reduced pain at night, which meant he slept better. The hypersensitivity in his rhomboid area was greatly reduced. He arrived early for his sessions and was eager to receive his massage therapy. He was seen for eight sessions and, each time, was enthusiastic about the improvement in his general well-being, reduction of pain, and greater ability to feel his upper body. Over time, Alejandro would have benefited from regular Swedish massage of his legs, in which he felt stiffness and had poor circulation due to his inability to move them. He certainly would have made greater gains in dealing with deeper levels of muscle tension and increased range of motion in his upper body. Eight sessions were only a beginning.

Discussion Questions

1. What tissues were injured or affected by Alejandro's spinal cord injury?
2. What symptoms were present?
3. What other areas of Alejandro's body might be affected by his spinal cord injury?
4. What was one way that Alejandro's personal boundaries were respected during his treatment?

kneading and effleurage as the tissue will be tight and dense. Swedish massage will have temporary effects on this problem; the use of craniosacral therapy or deeper techniques, such as myofascial release, may be more appropriate.

Back Massage

Spend extra time massaging the back if there is pain from sitting for long periods in a wheelchair. The techniques in Chapter 3 can be adapted to massage in a wheelchair, if more convenient. The neck, shoulders, and back can be massaged from behind the child. Roll the child's wheelchair up to a table and have him rest his head and arms on a pillow. The entire back is now accessible.



A child with flaccid (limp) paralysis could be injured if a joint is moved or forced beyond its existing range of motion. The muscles could be stretched and joints dislocated without the child's awareness. If muscle spasticity occurs during passive range of motion, stop the movement temporarily but continue to apply slow, gentle pressure on the body part until the muscle relaxes; then proceed with the motion.⁷

SPRAINS

A sprain occurs when a joint is wrenched or twisted past its normal range of motion. As soft tissue is taken past the normal length, minute tears occur in the ligaments that stabilize the joint, with leakage of blood and fluid into the surrounding tissue. Trigger points may be immediately activated in the ligaments and joint capsules.¹ Sprains are classified by the number of torn ligament fibers. First-degree tears, involving only a few ligament fibers, are characterized by slight swelling, pain, and loss of function. Second-degree tears, involving many ligament fibers, are characterized by modest swelling, diffuse tenderness, and loss of function. For example, the child will have difficulty bearing weight on the injured ankle. In a third-degree tear, the ligament actually ruptures and is no longer attached to the bone, involving extensive bleeding, increased pain, and greater instability.²

Children are more prone to fractures than to joint sprains because their bones are not completely ossified. However, as an adolescent approaches skeletal maturity, his ligaments and musculotendinous structures become more vulnerable to injury. With ossification nearly complete and with the fusion of the epiphyses and apophyses, the bones can better withstand force, and trauma is instead transmitted through the soft-tissue structures.³

Ankle sprains are the most common pediatric sports injury, occurring in approximately 6% of all

high school sports participants. Only 3% of these ankle sprains are of the medial ligaments; the remaining are sprains of the anterior talofibular ligament caused by inversion and supination of the foot (see Figure 4-4). Another common pediatric sports injury is the sprain of ulnar collateral ligament of the thumb. Forceful abduction (as can occur in football, skiing, hockey, wrestling, or baseball) tears the collateral ligament from its attachment at the proximal phalanx. Together with the tear of the specific ligament, there may be tearing of the entire joint capsule, stretching of nearby muscles, and even an associated chip fracture.⁴

Typical treatment for a sprain depends on severity. All degrees of sprain will cause pain, swelling, and loss of stability. There is always spasm of muscles near the sprained joint and, often, spasms farther away. With any sprain, the orthopedist will check to see if the child has simultaneously sustained a fracture. Specific attention will be given to the physal growth plates, as an injury here can affect growth and final length of the tibia. As with any injury that involves a fair amount of force, other damage may be done to the soft tissue around the joint or to individual bones.²

First-degree sprains are treated with ice; additional support, such as braces or taping; compression; and elevation. Second-degree sprains are treated with additional support, ice, crutches, and isometric exercises. A third-degree sprain is treated with a rigid cast and possibly surgery to reattach the ligament in its proper place, followed by strengthening and stretching exercises when the cast is removed. It is vitally important that the child's joint regains stability because a chronically loose ligament may predispose the child to repeated sprains. Repetitive, unprotected ankle sprains in a young gymnast, for example, can lead to serious inversion injury with complete ligamentous disruption and a need for subsequent surgical reconstruction.⁵ The child may also be more likely to develop osteoarthritis as an adult.

Prolotherapy, the injection of natural substances at the exact site of an injury to stimulate the person's immune system to repair damaged ligaments, has been shown to significantly increase ligament mass, thickness, and strength in children, as well as adults.⁶

APPROACH AND GOALS

Ice applications and contrast treatments can reduce swelling and pain, and ice massage can relieve muscle spasm. Massage can also relieve pain and swelling, which impair healing, and relieve muscle tightness and spasm, which hamper movement. Early massage of the area can prevent or reduce adhesions. Massaging will help the child relax the area, preventing chronic muscular guarding caused by trauma and pain.

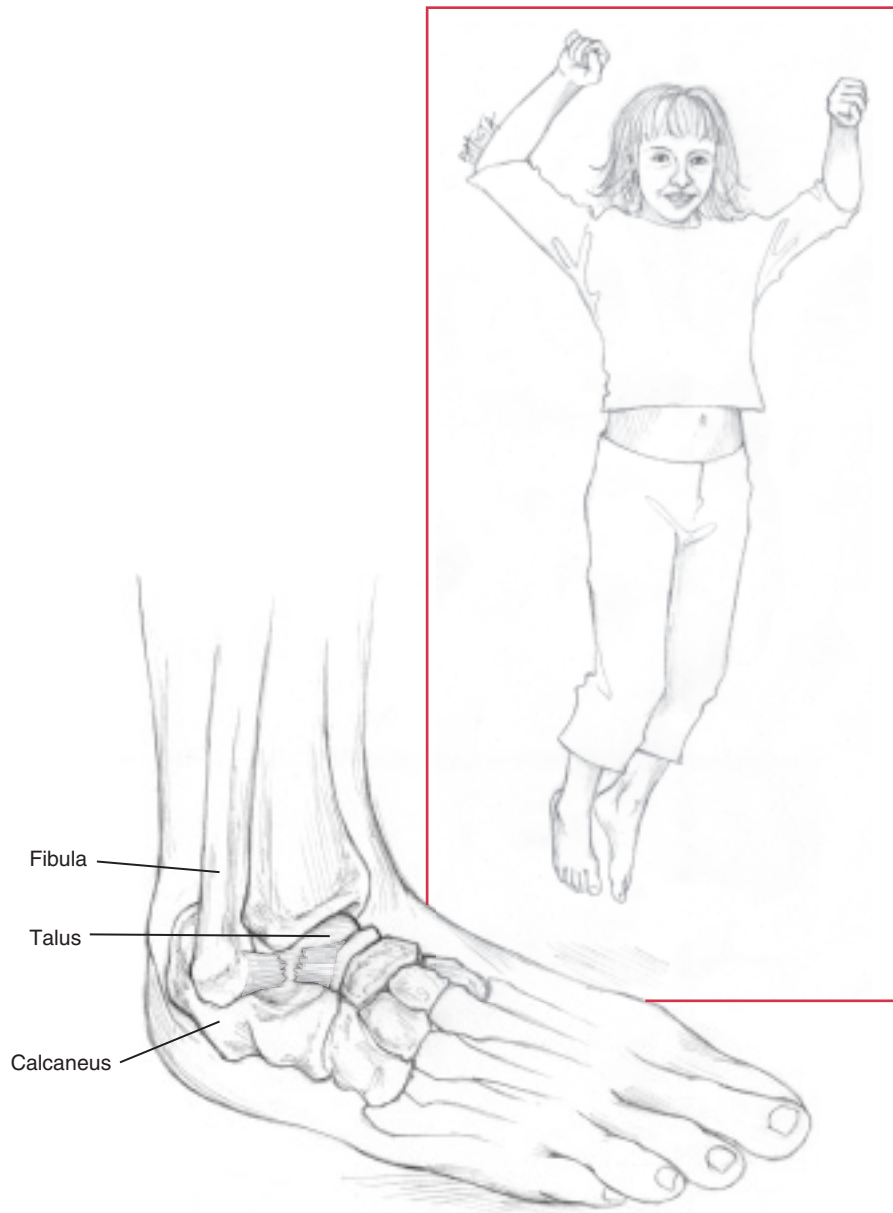


FIGURE 4-4 ■ Spraining of the Anterior Talofibular Ligament Following Forced Plantar Flexion and Inversion.

During the acute stages of a sprain (about the first 48 hours), massage should be done above and below the sprained joint to relieve swelling, increase circulation, and decrease muscle spasm and pain. After the first 48 hours, massage may be performed up to three times daily, as long as you are not causing discomfort or pain. Myotherapist Bonnie Prudden recommends trigger point therapy combined with exercise to treat a sprain immediately after injury; however, this should only be done by those with special training.⁷

MASSAGE AND HYDROTHERAPY FOR SPRAINS

ICE APPLICATION

Cold (in the form of ice packs) is generally used to treat a sprain in the first 24 hours. Ice massage may also be performed. Use an ice cup (see page 91) to massage the painful area and about 4 inches surrounding it. Continue ice massage for about 8 minutes.

CONTRAST TREATMENT

This treatment may be done on any joint; however, a contrast treatment for the ankle is discussed because ankle sprains are the most common pediatric sprains. Contrast treatments may be done three or more times daily.

- Step 1. Fill two deep buckets or washtubs with water, one at 110° F and one at 50° F.
- Step 2. Place the child's feet in the hot water for 3 minutes.
- Step 3. Place the child's feet in the cold water for 30 seconds.
- Step 4. Repeat steps 2 and 3.
- Step 5. Repeat steps 2 and 3.
- Step 6. Repeat steps 2 and 3.
- Step 7. Remove the child's feet from the water and dry them.

MASSAGE SEQUENCE FOR SPRAINS

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Apply oil or lotion.
- Step 3. Begin gentle stroking above and below the sprain. Use your palms (or fingertips, if the area is small) and alternate hands. Stroke up toward the heart. For a sprained ankle, stroke up the shins, over the knee, and up the thigh, then use your fingertips to stroke from toes to ankle. For a sprained wrist, stroke up the forearm and upper arm, then use your fingertips to stroke from fingers to wrist. Repeat for 5 minutes.
- Step 4. Thumbstroke the sprain. Be extremely gentle. Make short strokes toward the heart. Cover the sprain and a few inches around it. Repeat for 1 to 2 minutes.
- Step 5. Repeat step 3.



Avoid moving the joint itself, which might put stress on the injured ligament and cause pain.

TRAUMATIC BRAIN INJURY

The most common way that children become disabled is by brain injury. A high percentage of children—one of 500—have a traumatic injury to the brain each year. Falls, motor vehicle accidents, assaults, child abuse, and sports and recreation injuries are the main causes of traumatic brain injury (TBI).¹ In 1999, the majority of children who died from TBI had collided with a motor vehicle when riding a bicycle.² Helmet use alone can prevent many of these injuries.³

Specific injuries to the brain include fracture of the cranial bones (fragments may injure the brain); dam-

age or tearing of the nerve fibers of the brain; and bleeding from torn blood vessels (between the skull and the dura, beneath the dura, or inside the brain itself).

Depending on the nature of the damage and the care the child receives after the injury, a variety of impairments may result, including:

1. Motor impairments, such as spasticity, tremors, and ataxia (the inability to coordinate voluntary muscle activity during voluntary movement). Long-term, these impairments can lead to contractures, dislocations, and scoliosis.
2. Loss of oral motor skills.
3. Sensory impairments, such as **nystagmus** and eye muscle palsy.
4. Speech and language impairments.
5. Cognitive impairments, such as problems with attention, learning, judgment, and speed of information processing.
6. Changes in personality and behavior, such as irritability, a poor tolerance for frustration, aggression, poor emotional control, and apathy. The child's entire personality may appear to change. The child may also become depressed due to significant loss of abilities and ongoing struggles against impairments.

Traumatic brain injuries may have lifelong effects on an individual's functioning. One follow-up study of adults who had experienced severe TBI during their preschool years found that, although one-half had achieved average performance in school, only one-quarter were able to work full-time.¹

APPROACH AND GOALS

Acute rehabilitation care following traumatic brain injury includes turning the child to prevent pressure ulcers, preventing contractures by performing passive range of motion, and carefully positioning and splinting limbs. In this acute phase, after checking with the child's physician, massage may be used to release tension, stimulate circulation, prevent muscular atrophy and contractures, and maintain joint range of motion.

Long-term rehabilitation includes dealing with musculoskeletal complications from immobilization or impairments, including pain, spasticity, and contractures. The large mechanical forces involved with this injury may damage not only the brain, but also soft tissue and bones of the head, spine, and other areas. As a result, children may develop headaches, neck pain; tension in the muscles of the scalp, jaw, and face; upper back or shoulder stiffness; shallow breathing; back pain; and other types of chronic myofascial pain.⁴ Massage therapist Dianne Keanne,

who treats adults with traumatic brain injury, has found they often have scar tissue and other soft tissue dysfunction around the bones of the spine (Keanne D, personal communication, September 2002). Osteopath John Upledger has found that head trauma can cause malalignment of the cranial bones as they are forced into each other. Upledger found a common pattern of malalignment—a lateral strain of the cranial base, nasal and zygomatic dysfunction, and an unleveling of the cranial base.⁵

Dr. Gail Denton is a psychotherapist, massage therapist, and brain injury survivor. In her book, *Brainlash: Maximize Your Recovery From Mild Brain Injury* (Attention Span Books, 1996), she relates how a number of bodywork modalities helped speed her recovery, including Swedish massage to reinforce the natural state of her muscles, craniosacral therapy to help repair her brain, and Aston-Patterning to undo the impact of the accident on her soft tissue.⁴

Because children with TBI are likely to have chronically high levels of stress, providing relaxing and nurturing touch and helping them to relax may be as helpful as dealing with any physical complaints they have. Massage may also be used as a pleasant relaxing treatment after rigorous or painful physical therapy. Musculoskeletal pain from associated injuries can be treated effectively with massage. Refer to the specific complaints discussed throughout this book. Any contractures may be treated with massage after discussion with the child's physical therapist (see Contractures, Chapter 6). Passive range-of-motion exercises are important to treat and prevent contractures, and to increase body awareness and relaxation.

MESSAGE SEQUENCE FOR CHILDREN WITH TBIS

MESSAGE

Use the full-body techniques described in Chapter 3 for general relaxation, as well as specific treatments in Chapter 4 and 5 for specific complaints. Be sure to perform all passive range-of-motion exercises.



A child with flaccid (limp) paralysis could be injured if a joint is moved or forced beyond its existing range of motion. The muscles could be stretched and joints dislocated without the child's awareness. If muscle spasticity occurs during passive range of motion, stop the movement temporarily but continue to apply slow, gentle pressure on the body part until the muscle relaxes. Then proceed with the motion (Keanne D, personal communication, September 2002).

REVIEW QUESTIONS

1. Explain why children are more prone than adults to amputations, burns, fractures, and traumatic head injuries.
2. Choose three acute injuries and explain their specific treatment with hydrotherapy and massage.
3. Choose three injuries that have long-term effects and explain their specific treatment with hydrotherapy and massage.
4. Discuss how musculoskeletal injuries such as dislocations, fractures, and sprains may leave lasting traces in the child's soft tissue. How might these lasting traces affect the child as an adult?

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MASSAGE AND HYDROTHERAPY FOR THE COMMON DISCOMFORTS OF CHILDHOOD

5

KEY POINTS

After reading this chapter, the student will be able to:

1. Understand the most common childhood discomforts and explain the causes.
2. Understand the effects of emotional stress on the most common childhood discomforts.
3. Explain the signs and symptoms of five different types of headache.
4. Explain the rationale for using massage and hydrotherapy to treat each common discomfort.
5. Explain the importance of teaching children how to approach these discomforts through holistic, non-medication approaches.

In this chapter, the student will learn the background of many common childhood discomforts and how to use massage and hydrotherapy to relieve them. Although none of these conditions are dangerous to children's long-term health, they can still bother them very much. Unfortunately, physical pain is part of growing up. Injuries are a significant cause of pediatric pain. After injuries, headaches are the most common cause of nonpathologic pediatric pain, followed by stomachaches and then leg pain.¹ A surprisingly high percentage of children also have chronic musculoskeletal pain that directly affects their moods and behavior. Children cannot easily verbalize their body sensations; as a result, adults often do not know how much they hurt and may not seek treatment for their pain. Often it is discovered only when children have participated in a pain survey or other research where they are specifically asked if they have pain.² At some point during childhood, most children have bouts of pain resulting from earaches, constipation, or growing pains. Although other conditions do not cause pain, they can still be bothersome in other ways: considering that the average child has seven colds each year, the common cold may cause significant discomfort. Insomnia is yet another common complaint that does not involve pain but is bothersome to children. A dis-

cussion of depression has also been included in this chapter because it is extremely common in children and, although it does not cause physical suffering, it is terribly troubling.

The massage and hydrotherapy treatments in this chapter not only relieve common discomforts, but also provide the child with a positive model for holistic, non-medication ways to care for themselves.

Many treatments in this chapter combine hydrotherapy, whole-body Swedish massage strokes, and pressure point massage. Refer to Chapter 3 for descriptions of basic techniques, if necessary. When you have learned the basic treatments discussed here, you may incorporate techniques from other styles of massage and bodywork, as well, because they promote relaxation. Many discomforts covered in this chapter may not be caused by emotional stress; however, stress will probably worsen the symptoms. Any techniques that help children release tension and learn to relax will promote healing.

THE COMMON COLD

Most healthy children have about seven colds a year. Cold symptoms include nasal discharge

(runny nose); sore throat; dry cough; hoarseness; a general feeling of malaise; and, perhaps, a mild fever. Usually children feel quite ill for the first 3 or 4 days, gradually begin to feel better, and can expect to feel back to normal again in 1 to 2 weeks. About 20% of children will develop a bacterial infection in the last stages of the cold. An infection of the sinus or ear can occur if mucus cannot drain through swollen nasal passages, which then provides an excellent environment for bacteria to grow. A chest infection can develop if children have aspirated mucus into their lungs when swallowing mucus containing viral particles. The times most likely for a child to catch a cold are described in Point of Interest Box 5-1.

The following are simple preventive measures to prevent spreading a cold from one person to another:

- Cover the nose and mouth when coughing or sneezing to prevent spraying the cold virus onto others. Wash the hands immediately since they now have virus particles on them.
- Wash hands frequently throughout the day to prevent getting the virus on objects or on other people.
- Clean children's toys and household surfaces, such as faucet handles, light switches, door-knobs, and telephones, with a germicidal soap.
- Use disposable tissues and paper towels.
- Do not share towels, cups, dishes, utensils, or toothbrushes. These personal items should be washed in hot water to kill the cold virus.

APPROACH AND GOALS

A traditional hydrotherapy treatment at the very beginning of a cold is to raise the temperature of the whole body by a sauna, hot bath, or a hot foot soak. Raising the temperature of the body enhances the body's immune response and promotes the killing of the cold virus. However, you should not perform this treatment without special training and a physician's permission because it can raise the body temperature enough to create a mild fever. During the subacute phase of a cold, however, there are many massage and hydrotherapy treatments that can relieve symptoms of nasal and chest congestion and soothe and relax children who feel out of sorts. It is important to drink plenty of water to thin mucus and flush out the cold virus and to get extra rest to strengthen the immune system. Children should be seen by their physician if their fever is higher than 103° F; if they have a stiff neck, difficulty breathing, or are too sick to drink; or if they have had cold symptoms for longer than 7 to 10 days.



POINT OF INTEREST BOX 5-1

When Are Children Most Likely to Catch a Cold?

- Common colds begin in the nose because cold viruses grow best at 92° F and the temperature of the nose is cooler than the temperature of deeper body structures.¹ This may be why an old folk belief connects catching a chill to coming down with a cold.
- The cold virus thrives during the wet season because it can better survive outside the body when the humidity is high. Under the right conditions, it may survive for up to 3 hours.
- Children catch more colds in the winter because they spend more time indoors, where they can pass viruses around more easily. Children are notoriously unaware of such commonsense precautions as covering their mouths when they sneeze and washing their hands after sneezing.
- A high stress level nearly doubles the likelihood of becoming ill when exposed to a cold virus.²
- According to physician and author of *The Joy of Stress*, Peter Hanson, "Young children are usually brought to the physician with one infection after another for the first 5 or 6 years after starting day care or school. Partially, this is due to [contracting] contagious diseases from the other children, but mainly it is due to decreased resistance, from the stress of leaving the womblike comfort of the home."³

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MASSAGE AND HYDROTHERAPY FOR SINUS CONGESTION

Over-the-counter decongestants may give symptomatic relief but can make a child hyperactive and unable to sleep. In contrast, the following hydrotherapy techniques are highly effective for congestion of the sinus and nasal passages and have no adverse effects. One of the following techniques for sinus congestion can be chosen.

SINUS IRRIGATION WITH SALTWATER

Saltwater helps shrink swollen membranes and temporarily rinses the sinuses of mucus.

- Step 1. Use ¼ teaspoon salt to 1 cup warm water.
- Step 2. Instruct an older child to pour the warm saline into the palm, snuff up into one nostril, catch in the back of the throat, and spit out. (It is generally difficult to persuade a small child to try this, as they may not be able to do it without swallowing salt water).
- Step 3. Repeat 5 times for each nostril. Do the entire irrigation 3 to 5 times a day.

Sinus irrigation may also be done with a sinus irrigator tip attachment to a pulsing electric toothbrush (Water Pik) or with a neti pot, which is available at health food stores.

CONTRAST TREATMENT

This treatment helps drain the sinuses and increase circulation to the area.

- Step 1. Dip a washcloth in 110° F water and wring out. Place the cloth across the nose, leaving the nostrils exposed. Fold the ends of the cloth 90 degrees from the central point so that the ends lie alongside the nose. Leave on for 2 minutes.
 - Step 2. Replace the first washcloth with a washcloth or small bath towel that has been dipped in ice water and wrung out; leave on for 1 minute.
 - Step 3. Repeat hot and cold (Steps 1 and 2) two more times, for three changes.
-

STEAM INHALATION

Inhaling steam relieves nasal and sinus congestion, soothes the respiratory tract, and makes secretions looser and easier to spit up. The following two ways to inhale steam can be shown to parents:

- Pour six cups of boiling water into a heavy bowl that will not tip over. Have children sit at a table, drape a towel over their head to make a tent, and have them breathe in steam from the bowl, through the nose if possible. Continue for 5 to 10 minutes. A few drops of eucalyptus or peppermint oil may be added to the water to further open up the sinuses.
 - Another way to help children inhale steam is to have them take a hot shower, inhaling the steam for as long as possible. If they feel weak, a plastic chair may be placed in the shower to sit on. Very small children go directly into the shower with their parents holding them.
-

COLD SOCKS

- Step 1. Instruct the child's parents to wring out a pair of wool socks in very cold water and place the socks on the child's feet.
 - Step 2. Place a pair of dry, cotton socks on top.
 - Step 3. Leave the socks on all night. Initially, the feet will be cold, producing a vasoconstrictive effect on the blood vessels of the feet; however, the feet will gradually warm up as the socks trap the child's body heat. The blood vessels of the feet will then dilate and, eventually, will have a derivative effect similar to a hot footbath. This eases nasal congestion and helps the child get a good night's sleep.
-

MASSAGE SEQUENCE FOR SINUS CONGESTION

Positioning: Sit as you would for a head massage.

- Step 1. Basic relaxation sequence (page 70).
 - Step 2. Apply a few drops of oil or lotion to the face.
 - Step 3. Forehead and eye circles (Figures 3–30 and 3–31). Repeat 10 times.
 - Step 4. Place your thumbs on either side of the nose at the level of the eyes; use firm pressure and stroke slowly down to the bottom of the nose. Repeat 10 times.
 - Step 5. Pressure points around the eyes (see Figures 5–1 and 5–2).
 - Step 6. Pressure points on the side of the nose (see Figure 5–3). Begin just below the bottom of the eye socket. Press on either side of the nose with your thumbs, as if you were trying to touch your thumbs together. Use gentle to moderate pressure, as much as the child can firmly tolerate. Do a second point in the middle of the nose and a third point at the bottom.
 - Step 7. Forehead and eye circles. Repeat 10 times.
 - Step 8. Basic relaxation sequence.
-

MASSAGE AND HYDROTHERAPY FOR CHEST CONGESTION

The application of heat to the chest increases local circulation; feels soothing; and loosens secretions, making them easier to cough up. Massage is also soothing for a sick child and helps relax the muscles of the ribcage. Releasing tension in the pectoral muscles, intercostals, diaphragm, and upper back muscles will help the child breathe more easily and deeply. Percussion of the chest loosens secretions as well.



FIGURE 5-1 ■ Pressure Points Around the Eyes.



FIGURE 5-2 ■ Pressure Points Around the Eyes.



FIGURE 5-3 ■ Pressure Points on the Side of the Nose. These points are used to promote sinus drainage.

CONTRAST TREATMENT FOR THE CHEST

Equipment:

1. Linens: one plastic sheet; two cotton sheets; one blanket; and at least two pillowcases, washcloths, or terry cloth mitts.
2. A bowl (size: about 1 quart) containing ice cubes covered with water.
3. One moist heating pad for the child to lie on and one for the chest, or two Hydrocollator packs. A hot water bottle with a damp washcloth underneath is suitable for the chest of a small child.
4. Treatment table or covered massage surface on the floor.

Procedure (see Figure 3-55):

- Step 1. Cover the treatment table with a blanket, cover the blanket with a plastic sheet, and cover the plastic sheet with one cotton sheet.
- Step 2. Lay the moist heating pad on the sheet where the child's back will be and cover it with a pillowcase or towel. The moist heating pad should be positioned so that the child's entire upper back will be in contact with it. Lay the child on the pack. If it feels too hot to him, add another layer of cloth or towel. Monitor the heat carefully so he does not get burned.
- Step 3. Put 1 or 2 pillowcases or towels on the child's chest, then the moist heating pad or Hydrocollator pack, then cover with the one more towel on top. Again, check with the child to make sure the heat is not excessive. Cover the child with a sheet.
- Step 4. After 3 minutes, briskly rub the entire chest with a washcloth or terry cloth mitt that has been wrung

out in the ice water. First, tell the child what you are going to do, "Take a deep breath, and I'm going to rub your chest quickly with this cloth." Generally, the cold will feel good to the child because his chest will be very warm.

- Step 5. After rubbing his chest with the cold cloth, quickly put the heating pad or Hydrocollator pack back on his chest, cover it with a towel, and cover the child with the sheet. After 3 minutes, briskly rub the chest with ice water and replace heat application.
- Step 6. After 3 more minutes, remove the heat from the child's chest and rub it with an iced cloth. Dry his chest. Ask him to sit up. Remove the heating pad from under his back and rub his back with the washcloth wrung out in ice water. Dry his back. Do not allow the child to become chilled. Replace any damp linen with dry linen.
- Step 7. Ask the child to lay supine and begin the chest and upper back massage.

MASSAGE SEQUENCE FOR CHEST AND UPPER BACK

- Step 1. Basic relaxation sequence.
- Step 2. Chest and abdomen effleurage for 1 minute (Figure 3-34).
- Step 3. Chest friction for 1 minute (Figure 3-35).
- Step 4. Chest percussion (Figure 3-9). Cupping is used on the chest and upper back to help move mucus from the alveoli into the bronchial tubes, where coughing can expel the mucus from the body. As

you do cupping, ask the child to make a loud noise, and he will enjoy the resulting “funny sound.” First, perform cupping on the chest for about 1 minute. Relax your hands and slightly cup them, then gently percuss the child’s chest by alternately flexing and extending the wrists. This should not be painful—be firm but gentle. Avoid breast tissue on a girl.

- Step 5. Encourage the child to cough.
- Step 6. Repeat chest friction for 1 minute.
- Step 7. Repeat cupping for 1 minute.
- Step 8. Encourage the child to cough one more time.
- Step 9. Ask the child to turn on to his abdomen (prone position) and then perform back effleurage for 1 minute (Figure 3–2).
- Step 10. Perform cupping of the upper back for 1 minute. If there is mucus deep in the child’s chest, while cupping have the child place his head over the end of the treatment table and prop his torso with pillows. A 30-degree angle is effective for allowing mucus to drain.
- Step 11. Encourage the child to cough.
- Step 12. Repeat back effleurage for 1 minute.
- Step 13. Have the child lie down to rest in a position where gravity will help the mucus to drain, such as the position in Step 10. Another effective position is to have the child lay down on one side, with pillows under where the ribcage touches the table. The chest is higher than the mouth in this position, and the mucus can drain from the lower part of the chest and be more readily coughed up.

CONSTIPATION

When a normally regular child has not had a bowel movement for 2 to 3 days or has difficulty having a bowel movement, she is considered constipated. If she has not had a bowel movement in 4 days, she should be seen by a physician to rule out any serious problems.

A diet high in fiber is the best way to prevent constipation. High fiber content is found in whole grains; food made with bran, such as cereal or muffins; beans; popcorn; fresh fruit and vegetables; and dried fruit, such as prunes and figs. Prune, apricot, and papaya juice are mild laxatives. Drinking plenty of water is important; doubling a child’s water intake for a few days will often resolve constipation. Diuretics, bulk-forming laxatives, methylphenidate hydrochloride (Ritalin), and certain seizure medications and medications that affect peristalsis may cause the child to need more fluids and can contribute to constipation.¹

APPROACH AND GOALS

The child’s parent may try a simple hydrotherapy treatment for constipation: have the child drink one to two large glasses of lukewarm water first thing in the morning, at least one-half hour before breakfast. This often stimulates the intestines to move. If you have

taught the parents to perform abdominal effleurage, it can be done immediately.

Massage can relieve constipation by relaxing the abdominal musculature and stimulating peristalsis. If a child is chronically constipated, massage can be an important part of a regular program to resolve the problem. For some children, chronic tension in the gluteal muscles prevents them from relaxing the anal sphincter and having a bowel movement. Sandra Wheeler, an infant massage instructor, taught massage to the mother of a 6-month-old infant who was chronically constipated. The infant’s pediatrician had told the mother that the child’s constipation appeared to be caused by an anal sphincter that was too small and had prescribed suppositories for the infant. During massage instructions, however, Ms. Wheeler noticed that the infant’s gluteal muscles were extremely tight. Infant massage strokes for the abdomen and simple Swedish massage of the buttocks completely resolved the infant’s constipation (Wheeler S, personal communication, April 1992). Although infant massage is not discussed in this book, this story illustrates that children, even very young children, may have chronic gluteal tension that needs to be treated before constipation can be resolved.

MESSAGE AND HYDROTHERAPY FOR CONSTIPATION

HOT WATER BOTTLE OR HOT PACK APPLICATION

Place bottle or pack on the stomach for 10 minutes. This will not affect constipation, but will relieve discomfort and relax the abdomen in preparation for massage.

MESSAGE SEQUENCE FOR CONSTIPATION

- Step 1. Basic relaxation sequence (see page 70).
 - Step 2. Apply oil or lotion.
 - Step 3. Perform abdominal effleurage (Figure 3–36). Repeat 20 times.
 - Step 4. Thumbstroke the stomach (see Figure 5–4). Sit at the child’s right side. Begin just inside the right hipbone and thumbstroke straight up to the ribcage, across the top of the abdomen, and down the left side. Stop just above the left hipbone. Go slowly and thoroughly; the entire stroke should take 2 minutes to do one time. Use medium pressure. This stroke is extremely effective for constipation. Occasionally, infants and small children may have a bowel movement during abdominal massage. Older children may need to get up and go to the bathroom immediately.
 - Step 5. Perform abdominal effleurage. Repeat 20 times.
 - Step 6. Basic relaxation sequence (see page 70).
-



FIGURE 5-4 ■ Thumbstroking the Stomach. A deeper stroke that follows the path of the large intestine.

DEPRESSION

I was giving a 20-year-old girl her first massage. When she was 14, she was severely depressed after her parents divorced. She ran away from home, lived on the streets, became addicted to heroin, and then went through a detox program. Now, 6 years later, although she was still free of her heroin addiction, she continued to struggle with depression. I was seeing her to treat severe muscle spasm and pain in her back. As soon as I began to massage her back, she turned around, looked up at me, and said, "This is better than *any drug!*" Before this, she had equated something that made her feel good with something that was morally and physically bad for her. Sadly, after she went through the detox from heroin, she thought she would never experience pleasure again.

—Annie Siemens, *massage therapist*
(*personal communication, June 1999*)

It is estimated that 2% of American children and 8% (3 million) of adolescents are depressed.¹ Depression is a mood disorder characterized by feelings of hopelessness, sadness, loneliness, despair, low self-esteem, and social isolation. Depression is most often seen after a child has experienced a serious loss, such as a dear friend moving away, a death in the family, or a change of neighborhoods or schools. Known as reactive or situational depression, this is a normal reaction to loss.

When a child suffers more extreme depression that continues for an extended period, it changes from a normal, distressing reaction to something more serious. When the child not only feels sad, but also has sleep and appetite disturbances; feelings of worthlessness, guilt, and hopelessness; fatigue; and an inability to concentrate lasting 2 weeks or longer, the child is considered clinically depressed.

Signs of depression in infants and toddlers include depressed or irritable moods, excessive whining, sleeping and eating disturbances, weight loss, a loss of interest in activities, and decreased social interaction. In older children, some or all of the following signs may be seen: overactivity or underactivity, a sad appearance, irritability, anxiety, apathy, and difficulty dealing with frustration. Children will often have physical complaints, such as increased muscle tension, stomachaches, headaches, insomnia, diarrhea, or fatigue.² Blood tests may show increased levels of cortisol, a stress hormone. The signs of depression in teenagers are similar to those of children, but may also include substance abuse if teens begin using drugs or alcohol to soothe or escape from painful feelings. Teens who smoke may use nicotine to deal with feelings of depression and are more likely to become depressed than their nonsmoking peers. This may explain why antidepressant drugs can help adults quit smoking.³

Depression is linked to genetics and to the environment. You are at a higher risk for depression if you have a sibling or relative with depression.² The greater a child's total life stress, the greater the likelihood that she will be depressed. Major trauma in the first 4 years predisposes an adolescent to psychological problems, including depression, when stressful situations occur in the teen years.⁴ Any child with a higher than average score on a life stress scale may be at risk for depression (Chapter 1).

Standard medical treatment for depression includes antidepressant medications and psychotherapy. Medication as a first-line course of treatment is used for children and adolescents with symptoms so severe that they would prevent effective psychotherapy, children with chronic depression, and children with chronic or recurring episodes. Following the remission of symptoms, treatment with medication and/or psychotherapy is normally continued for at least several months.¹ Between one-half million and one million prescriptions are written for antidepressants every year for American children and adolescents, and the number is growing.⁵

A mind-body approach that has had positive effects on depression in children is relaxation training. It can reduce anxiety and acting-out behavior and may be more effective than "talk" therapy. Many hypnotherapeutic techniques that treat **conversion disorders** in children combine hypnotherapy to help the child cope with her immediate anguish with long-term treatment. Children may learn self-hypnosis for relaxation and continue psychotherapy to treat long-term depression and other emotional problems.⁶ In one study, children who were depressed and hospitalized in a psychiatric hospital were trained in relaxation techniques (yoga and progressive relaxation)

and received massage therapy. The children in the study reported decreased anxiety, and they were observed by nurses to be less anxious and in more positive moods. Because more than one relaxation technique was used, it is not possible to tell which technique helped the most, although all three techniques have been shown to alleviate stress in children.⁷

APPROACH AND GOALS

Massage therapy alone is not a primary treatment for depression but can be an excellent adjunct treatment. Three Touch Research Institute studies assessed the effect of massage therapy on children who were depressed. In the first study, children ages 7 to 18, who were hospitalized for depression and other emotional disorders, were given 30 minutes of Swedish massage a day for 5 days. They were less anxious and depressed, slept better, and had lower levels of stress hormones.⁸ In the second study, children ages 5 to 10, who had been through Hurricane Andrew in Florida in 1990 and had posttraumatic stress disorder, were given 30 minutes of Swedish-type back massage twice a week for 4 weeks; subsequently, they were less depressed.⁹ In the third study, adolescent mothers, who had recently given birth and were depressed, were given a 30-minute Swedish massage 2 days a week for 5 consecutive weeks. They were less anxious, less depressed, and had lower stress hormones after their sessions.¹⁰

The author has treated a number of teenagers and young adults with depression, and found that massage not only offers relief from the pent-up physical tension that is such a major component of depression, but also helps by giving them another person to talk to and be part of their support system. A 15-year-old girl with severe depression was referred by a counselor to massage therapist Jane Megard. The counselor wanted to help the girl find ways to nurture herself. Over a 2-year period, a combination of medication, psychotherapy, and massage proved highly effective in relieving her depression (Megard J, personal communication, June 1999). Acupressure is also reported to relieve depression in children.¹¹

The daughter of physical therapist Martha Pauly was a happy and highly functioning child until age 13, when she began to seem sad and withdrawn, and suffered from stomachaches and fatigue. Her family physician originally diagnosed her stomachaches as caused by anxiety and stress. When her stomachaches did not improve, she was seen by a social worker and a psychiatrist; both diagnosed her as seriously depressed. For months, she was prescribed powerful psychiatric medications and hospitalized, and her condition deteriorated dramatically. She became **catatonic**, paranoid, and

suicidal. Her family then decided to make a drastic change in the way the girl's depression was being treated. Gradually, she was weaned from psychiatric medications. Her new treatment was based on craniosacral therapy, herbs and supplements, and counseling. After a period of months, she gradually recovered from her depression, reentered school, and now continues to function at a high level. Her family believes that her original depression was triggered by hormonal imbalances, combined with a perfectionist personality.¹² Osteopath John Upledger has treated many depressed adults with craniosacral therapy and has never seen a case of severe depression without a severe anterior-posterior compression of the cranial base.¹³

MASSAGE THERAPY FOR CHILDREN WITH DEPRESSION

Massage therapy, while helpful, is not a cure for depression. Children should receive some type of regular psychotherapy as well as massage. The techniques presented in Chapter 3 may be used, as well as many other forms of massage and bodywork. Begin each massage with a progressive relaxation sequence to help the child learn to relax and release tension. Perform whole-body massage for several sessions before doing concentrated massage on any particular area, so that children get a clear sense of their total physical self. Any hands-on therapy that offers relaxation, nurturing touch, and personal contact with a caring adult will be beneficial. Regular massage will be required for at least a few months for a seriously depressed child. The therapist should be aware that the child may have a need to talk as much as a need to be massaged.

EARACHE

Ear infections are the most common cause of pediatric ear pain. Almost 35% of children have one or more ear infections in the first year of life, which can predispose them to recurring ear problems that may continue long into childhood.¹ Risk factors for pediatric ear infections are identified in Point of Interest Box 5-2. Earaches may also be caused by exposure to severe cold or injuries such as minor head trauma. At age 7, for example, the author's son fell from a diving board into a swimming pool in such a way that his entire body weight landed on one ear. He subsequently had pain in that ear in cold weather and when swimming underwater.

APPROACH AND GOALS

Massage and hydrotherapy treatments for earaches are not a substitute for medical treatment. When a child



POINT OF INTEREST BOX 5-2

Risk Factors for Ear Infections

Infants and children have more ear infections than adults because their eustachian tubes are wider, shorter, and more horizontal. As a result, children's middle ears are not able to drain as well as those of adults, and the eustachian tube opening may more easily be obstructed by mucus or debris. This allows bacterial infections to take hold more easily, as bacteria from the throat breed in the moist environment of a blocked eustachian tube. Common contributors to ear infections include:

- Upper respiratory problems, such as colds, asthma, or nasal congestion, precede nearly 50% of all ear infections.¹ Infants and toddlers in day care are twice as likely to contract an illness that lasts more than 10 days, causes a fever of 102° F for more than 3 days, or requires medical attention than children in home care.¹
- High levels of certain toxic industrial chemicals.²
- Food allergies.
- Vitamin or mineral deficiencies.
- Being bottle-fed as a baby. Breast-fed babies have fewer ear infections than bottle-fed babies because their eustachian tube muscles are better developed and their eustachian tubes do not as easily fall shut.
- Living in a home where one or more adults smoke cigarettes.
- Being fed while lying flat on the back with a bottle propped in the mouth, or being put to bed with a bottle at night. Swallowing while lying down allows fluids to more readily enter and pool in the eustachian tube.
- Having fetal alcohol syndrome.
- Having Down syndrome.

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2. Steingraber S: *Having Faith: An Ecologist's Journey to Motherhood*. Cambridge, MA: Perseus Publishing, 2001, p 271

has ear pain, only a physician can determine if an ear infection is present, and, if so, how it should be treated. Massage and hydrotherapy treatments can relieve pain, comfort a child and, possibly, promote faster healing.^{2,3} Massage, if done gently and sensitively, will soothe and relax the area and improve the circulation of blood and lymphatic fluid. Dr. Michael Schmidt, author of *Childhood Ear Infections* (North Atlantic Books,

1996), recommends that the front and sides of the neck be massaged to enhance tonsil and adenoid function, improve the environment of the eustachian tube area, and enhance lymphatic drainage.¹

There is a special massage technique to drain the eustachian tube which is effective for congestion, called endonasal technique, that is often taught to the parents of a child with ear congestion. It is not covered in this book because it may not be in the scope of practice for massage therapists in many states. To learn more about this technique, contact a naturopathic physician.

MASSAGE AND HYDROTHERAPY FOR EARACHE

Use one of the following four treatments prior to massage:

MOIST HEAT APPLICATION TO THE EAR

Place heat on the ear for 30 minutes, using a small heating pad, washcloths wrung out in hot water (as hot as the child can tolerate), or a partially filled hot water bottle. Using a standard hot footbath at the same time will help alleviate congestion and pain.

HOT WATER GARGLE

Gargle with water that is as hot as can be tolerated for 10 minutes. This is a more appropriate treatment for an adult because it is too difficult for most young children to do without choking on the water; however, a teenager may be able to gargle without difficulty. The heat will relieve nasal and sinus congestion.

STEAM INHALATION

Refer to directions in the Common Cold section, page 121.

CONTRAST TREATMENT

- Step 1. Wring out a washcloth or small towel in hot water. With the child lying on his side, apply the hot towel over the painful ear for 3 minutes. To keep the towel hot, cover it with a plastic bag and another towel.
 - Step 2. Wring out another washcloth or small towel in ice water. Apply it to the child's ear and leave on for 30 seconds.
 - Step 3. Repeat hot and cold (Steps 1 and 2) twice, for three changes.
-

STERNOCLEIDOMASTOID MASSAGE

Positioning: Have the child lay supine, with a pillow under his head.

Step 1. Basic relaxation sequence.

Step 2. Gently apply oil or lotion.

Step 3. Perform superficial effleurage of the sternocleidomastoid muscle. Begin by placing your fingertips on the sternocleidomastoid, about 1 inch above the clavicle. Stroke down the muscle to the clavicle. The pressure should be directed as if to lengthen the muscle, and pressure should not be directed up against the neck. Repeat 10 times. Then move up about 1 inch and again stroke down the muscle toward the collarbone. Repeat 10 times. Again move up about 1 inch, and stroke toward the collarbone 10 times. Work your way gradually up the muscle toward the ear. Massage for about 1 minute, then repeat on the other side.

Step 4. Apply pressure to points on the sternocleidomastoid muscle (Figure 5-5). Do one side at a time. Begin at the base of the muscle and press four separate points between the base of the muscle at the clavicle and the top. Gently pinch the muscle between your thumb and middle finger and pull it away from the neck. Hold each point for about 10 seconds. Do not push down into the child's neck or on the child's throat. Press each point just until the beginning of pain. Ask the child for feedback. You might say, "Tell me when this just begins to hurt, and I will stop right there." You establish trust with the child when you work at his tolerance

level and listen carefully to his feedback. Hold all the points on the left sternocleidomastoid and then repeat on the right side.



Parents of a child with an earache should check with the physician if they suspect the child has an ear infection. A child with ear pain should always be seen by a physician if he has a temperature higher than 103° F, if he refuses to drink liquids, or if he has a stiff neck or headache.

EYE FATIGUE AND STRAIN

Children are not born with adult visual capabilities. The visual system at birth is so immature that everything appears blurred (acuity is 20/600; 30 times worse than 20/20) and almost all adult visual skills are absent. These include the ability to distinguish color, to move the eyes without moving the head, to use both eyes together, to locate objects in space, to detect contrasts, to follow moving objects, and to perceive depth. All these skills will develop as the connections between the eye and brain mature. 20/20 vision is not reached until children are ages 3 to 5; their visual system typically does not fully mature until age 12.^{1,2} Visual development is an ongoing process that is deeply affected by children's physical and emotional states and by the environment in



FIGURE 5-5 ■ Pressure Points on the Sternocleidomastoid Muscle.

which they live. Natural vision improvement teacher Janet Goodrich describes eyesight as “a living, changing expression intimately reflecting the child’s inner life.”³ Any problem that obscures vision or interferes with the normal coordination of the eyes can affect a child’s visual development.

Eye fatigue and eyestrain may occur to any child, with or without a normal visual system. Their complaints may include eyes that are tired, sore, dry, or itchy; blurred vision; headaches; double vision; body fatigue; or tension in the eyes, temples, forehead, neck, shoulders, or back. They may complain of headache or eye pain after an extended period of near-vision tasks, such as working at a computer or reading a book. Or they may simply seem overly tired for no obvious reason. Chronic tension in the muscles of the head and upper body may be a sign of chronic overwork or inappropriate use of the visual system.

CAUSES OF EYE FATIGUE

What causes eye fatigue and strain?

1. Trying to use the eyes when there is an uncorrected vision problem. Up to 5% of infants are born with some kind of visual abnormality or will develop one in the first few years of life. In young children, the most common visual deficiencies are **myopia**, **hyperopia**, **astigmatism**, and **strabismus**. Older children may or may not outgrow these problems. One national health survey of 7,000 American youths, ages 12 to 17, found that one of 12 had significant visual problems and 43% were unable to read at a 20/20 level.⁴ Many of the causes of the common visual deficiencies are unknown. Other than mechanical eye problems, nutrition, illness, trauma at critical stages of visual development, and even misalignment of the cranial bones may affect the child’s vision.⁵⁻⁷
2. Emotional stress. “One day, when I was 7 years old, I was playing alone in my bedroom. I decided to go downstairs for a snack. I remember coming down the stairs and opening the door to the kitchen. As I stepped in, I realized that my mother, father, and sister were in the kitchen. I watched as my father threw my sister into a corner of the room. She fell on the floor and he began to kick her. My sister and father were both screaming, and my mother and I were paralyzed. I wonder now if I was going into shock. I heard knocking and looked over at the sliding glass door in the living room. My friend Ann was behind the glass door and was trying to look through. She could see me. I remember being terrified that she would see what was happening in the kitchen. I still could

not move and then I realized that my vision was changing. Everything went blurry and objects became less clearly defined. I have never regained the visual acuity I lost that day. I got my first pair of glasses soon afterward and have needed glasses for the last 40 years.” (Author’s client, personal communication, October 2002)

Emotional stress may be manifested by chronic tension in the internal muscles of the eye (those that change the shape of the lens and the size of the pupil) or in the external muscles that move the eyeballs, close the eyelids, furrow the brow, and squint. For example, emotional stress causes the pupillary muscles to dilate to allow better peripheral and night vision. Many optometrists, individuals with vision problems, teachers of natural vision improvement, and psychiatrists have observed that the eye may become the target organ for the expression of a variety of emotional conflicts and stress.^{8,9} A period of high stress caused by such events as a death or divorce in the family, a move to a new home, or a negative learning situation in school may interfere with a critical phase of normal visual development.^{2,5,10-13}

3. Excessive close work, such as reading, doing computer work, or performing other near-vision tasks, can cause tremendous stress on an immature visual system. A study at the University of California at Berkeley of 253 children found that multiple-hour computer use leads to focusing problems and nearsightedness or farsightedness. Before children were spending so much time on the computer, a similar pattern was seen in those who were reading chapter books before fourth grade.¹⁴ An overload of schoolwork in the primary grades may stress the vision system to the point of causing a breakdown in the child’s visual skills. To perform near-vision work, the child’s visual system must be mature enough to perform a variety of visual tasks, such as focusing, tracking a line of print across the printed page, using the two eyes together, converging, and recognizing different shapes.

To prevent visual strain when performing near-vision tasks, children should pause at the end of each page to look out a window, take a deep breath, and blink. This will rest and moisten the eyes. A big yawn will stimulate the eyes to water. The eyes should also be rested at least every 20 minutes when writing, watching TV, or using a computer. If things look blurry when children look up, they should get up and move around before attempting to read again.

MUSCULOSKELETAL ADAPTATIONS TO VISUAL PROBLEMS, EMOTIONAL STRESS, AND EXCESSIVE CLOSE WORK

The musculature of the head and neck can be affected and, in certain ways, shaped by the child's vision. For example, movement teacher Moshe Feldenkrais observed that, with a dominant eye, the muscles that turn the head are very different. "The left sternocleidomastoid muscle in a left-eyed person will be softer. The right sternocleidomastoid, which contracts to turn the head to the left, will be stronger, stiffer, and less nimble."¹⁵

Holding the head in unusual positions to accommodate visual problems may cause chronic tension in the upper back, cervical, or facial regions. Uncorrected myopia, for example, can activate trigger points in the suboccipital muscles as a result of sustained forward flexion of the head and neck.¹⁶ If a myopic child slouches forward and strains to see, he or she may have deep tension in the jaw, neck, shoulders, and erector spinae muscles.¹⁷ Vertical strabismus, when one eye is higher than the other, will cause the child to tilt the head in an attempt to keep the eyes level. This can cause a type of torticollis in which the head is persistently laterally flexed and rotated on the neck and the sternocleidomastoid and other cervical muscles are overcontracted on one side.¹⁸ The child with decreased visual acuity, for any reason, is likely to activate trigger points in the occipitalis muscle by persistently contracting the forehead and scalp muscles.¹⁶ Anyone who is light-sensitive or has astigmatism is likely to squint, which can activate trigger points in the orbicularis oculi.¹⁶ Astigmatism is often accompanied by tension in the muscles of the neck, particularly the muscle around the top cervical vertebrae.¹⁹

Wearing glasses for correction of visual problems may also cause tension in the upper body. Cocking the head to avoid the reflection of overhead lights can chronically strain the sternocleidomastoid.¹⁶ If the lenses have too short a focal length, causing the child to tilt the head in sustained flexion in order to read or do other close work or if the frames of the eyeglasses are improperly adjusted (causing the child to tilt his head too far forward to read), trigger points can be activated in the suboccipital, semispinalis, capitis, semispinalis cervicis, and multifidi muscles.¹⁶ All children who wear glasses should be checked for tension in the muscles of the head, neck, and face.

APPROACH AND GOALS

Massage and hydrotherapy can increase circulation and ease muscle tension in and around the eyes. Heat applications over the eyes are soothing, increase circulation, and relieve pain and inflammation. Cold appli-

cations initially cause vasoconstriction, which is then followed by vasodilation. Cold is effective in relieving pain and promoting healing in the eyes.²⁰ Alternating hot-and-cold applications causes a dramatic increase in the blood flow to the eyes. The goal of massage is to relieve muscle tension and improve circulation in the eyes and the surrounding area. Because eyestrain may cause tension, not only in the eyes but also in other parts of the child's body, a massage for eyestrain includes techniques for the face, especially around the eyes, and techniques for the neck and upper trapezius. Children may be taught to massage around their eyes to relieve tension.

Many teachers of natural vision improvement have successfully reduced or eliminated strabismus, myopia, hyperopia, and astigmatism in children using exercises that relax and stimulate the eyes and with massage that treats tension of the eyes and the entire upper body. Helping the child understand the contribution stress makes to vision problems has been an important part of therapy.³ Osteopath John Upledger has successfully treated cases of strabismus and problems with visual acuity with craniosacral therapy; he believes that malalignment of the cranial bones, such as lateral strain lesions of the cranial base, and atlanto-occipital dysfunction, may be directly related to visual problems.⁷

Palming is another way to relax the eyes. The child cups her hands over the eyes, crossing the fingers over the middle of the forehead. Pressure is not put on the eyes or on the eyebrows; the eyes are simply covered to block out the light. The child should then take deep comfortable breaths and let the eyes relax. And, last but not least, the child can learn to massage his or her own face, especially around the eyes.

MASSAGE AND HYDROTHERAPY FOR EYE FATIGUE AND STRAIN

CONTRAST TREATMENT

- Step 1. Have the child lie down. Fold a washcloth into a narrow strip, and dip it into a bowl of water (temperature, 110° F). Wring the cloth out and place it over the child's eyes. Because the skin over the eyes is very thin, ask the child if the washcloth is too hot and, if so, let it cool a moment before reapplying. Leave it on the eyes for 3 minutes. If the washcloth appears to be cooling off too much, replace it with another cloth after 2 minutes.
- Step 2. Fold another washcloth into a narrow strip and dip it into a bowl of very cold water (put ice cubes in the water to make it as cold as possible). Wring the cloth out and cover the eyes, making sure the nostrils are exposed. Leave it on for 1 minute.
- Step 3. Repeat hot and cold (Steps 1 and 2) twice, for three changes.

MASSAGE SEQUENCE FOR EYE FATIGUE AND STRAIN

Positioning: The child should be supine on the treatment table or the floor, with the therapist seated at the child's head.

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Apply oil or lotion to face.
- Step 3. Perform forehead and eye circles (Figures 3–30 and 3–31). Repeat 10 times.
- Step 4. Make small circles on the temples; go slowly and use as much pressure as you can without causing pain. Repeat for 1 minute or more.
- Step 5. Thumbstroke between the eyebrows. Thumbstroke toward yourself instead of away. Place your thumbs next to each other between the eyebrows. Stroke up with one thumb, then the other. Return your first thumb to the starting position and stroke upward; return your second thumb to the starting position and stroke upward. Continue for 30 seconds or more.
- Step 6. Perform forehead and eye circles. Repeat 10 times.
- Step 7. Pressure points around the eyes. Do both sides at once (Figures 5–1 and 5–2). Begin at the inside corner of each eye socket, just below the beginning of the eyebrow. With your index fingers, gently curl underneath the ridge of bone and press upward. (Do not press on the eye.) Press to the point of soreness, not pain; back off a bit and maintain that pressure for 10 seconds. Do a second and a third point, evenly spaced in the middle part of each socket, and finish with a fourth point at the outside corner. Hold each point for 10 seconds. Using your thumbs, press on a fifth and sixth point in the middle of the socket below the eye, and finish with a seventh point at the inside corner.
- Step 8. Face effleurage (Figures 3–32 and 3–33).
- Step 9. Petrissage of the scalp (Figure 3–29).
- Step 10. Pressure points on the base of the occiput (Figure 5–6). Let the child's head rest in your hands, as in scalp petrissage. Curl your fingertips under the bony ridge at the base of the skull (close to the hairline). Begin with a pressure point just a little

to either side of the midline. Do both sides at once. Press upward with your middle fingers. Press just to the point of soreness (not pain), then back off slightly and hold for 15 seconds. Do two more points, moving out toward the ear. Ask the child to help you locate points that are tight or sore. Hold each point for 15 seconds.

- Step 11. Pressure points on the sternocleidomastoid muscle (Figure 5–5).
- Step 12. Pressure points on the upper trapezius (Figure 5–7). Begin this stroke where the neck intersects the shoulder, and do both sides at once. With your thumbs, press directly down (toward the feet) just to the point of soreness (not pain), then back off slightly and hold for 10 seconds. Do three more points along the top of the shoulder (as if you were following the shoulder seam on a shirt), moving away from the neck. Ask the child to help you locate points that feel tight or sore. Hold for 10 seconds each.
- Step 13. Face effleurage; repeat six times.
- Step 14. Cup your hands gently over the child's eyes, with fingertips pointing toward each other. Be careful not to press on the eyeball. Remind the child to relax the eyes. Hold for 30 seconds, then slowly take your hands away.
- Step 15. Basic relaxation sequence.

GAS PAIN

A couple years back, I took care of a 9-year-old boy who was a quadriplegic and had been on a respirator for 5 years. He would swallow a lot of air trying to talk around his respirator and have terrible stomachaches. Massaging his stomach helped relieve the pain and gas. I would also massage his legs, arms, and chest. He really enjoyed the massage. It gave him a lot of sensory stimulation, as well as relaxation.

—Julie Fronzuto, RN (intensive care nurse, personal communication, December 1991)



FIGURE 5–6 ■ Pressure Points of the Base of the Occiput. These points are useful in tension headache massage.



FIGURE 5-7 ■ Pressure Points on the Upper Trapezius.

Gas pain is caused by the excessive collection of gas in the stomach or intestines. Many a parent has been faced with a small child with such severe abdominal pain that he or she has called their family physician, worried that the child might have appendicitis or another severe problem, only to have the child pass gas while waiting to hear the physician's voice! For children prone to severe gas pain, a few simple suggestions to parents may help:

- Food should be eaten slowly and not gulped down.
- Children should move around after eating rather than sitting still—this moves gas.
- Foods that are known to cause gas in a particular child should be avoided.
- Hot drinks, especially peppermint tea, may help children pass gas.

APPROACH AND GOALS

Hydrotherapy can help prepare the child's abdomen for massage by relaxing the abdominal musculature. Abdominal massage is effective for gas pain because it relaxes the abdominal musculature even further, and stimulates movement of gas through the intestine.

MASSAGE AND HYDROTHERAPY FOR GAS PAIN

MOIST HEAT APPLICATION

- Step 1. Wrap a hot towel wrung out in hot water and covered with wool or polar fleece, a moist heating pad, or a hydrocollator pack around the waist area, and leave it on for 10 to 15 minutes.

MASSAGE SEQUENCE FOR THE ABDOMEN

- Step 1. Use the same strokes used to treat constipation (see page 124).
- Step 2. Concentrate the massage on less sensitive areas (if the child's abdomen is sensitive to pressure) until his abdominal muscles begin to relax and the gas begins to move. Pressure should be to the child's tolerance level.
- Step 3. A few drops of essential oil of peppermint may be added to the massage oil or lotion.

GROWING PAINS IN THE LEGS

Growing pains are defined as deep and recurring aches, typically felt by children in their legs. Although the pains have no known cause, growing pains are clearly not related to any disease process. Approximately 15–30% of children experience them between the ages of 4 and 12. Usually growing pains are experienced late in the day or at night, often with such severity that the children are awakened from sleep. Days, weeks, or months may go by without the pains occurring.¹

Although no cause has been proven, most physicians attribute them to muscle spasms that result from fatigue and ischemia of leg muscles that have been active during the day or to inflammation of the leg muscles as a result of overexercise. Either theory explains why a child could be active until bedtime, go to sleep without leg pains, and wake up with them in the night. Some physicians believe that emotional stress may also contribute to growing pains.² Medication and warm soaks are the standard treatment.

APPROACH AND GOALS

Treatment of the leg muscles has shown success in treating growing pains. Pediatricians Talcott Bates and Edward Grunwaldt relate the case of a 3-year-old boy who had such severe calf pain that he napped poorly during the day and awoke screaming at least five times each night. Treatment of trigger points in the vastus lateralis and gluteus minimus muscles of both legs was performed four times at 2-day intervals, using ethyl chloride spray and stretching. The child no longer complained of pain and slept well at nap and nighttime.³ Another muscle treatment that has been successful is stretching of the quadriceps, gastrocnemius, soleus, and hamstring muscles (Figure 5–8). A study was made of 34 children between the ages of 5 and 14 who were divided into either a control group that received no stretching exercises or a muscle-stretching group. Parents of children in the second group were taught to stretch their children's leg muscles

for 10 minutes twice a day. Children in the muscle-stretching group had a significant decrease in growing pains compared with the children in the control group.²

Massage therapy and hydrotherapy can relieve growing pains by decreasing muscle tension and increasing circulation in the legs. These soothing treatments are especially appropriate to teach to parents because they need to be done when the child is in pain, which is usually at night.

MASSAGE AND HYDROTHERAPY FOR GROWING PAINS

WARM BATHS

Simply taking a warm bath at about 102° F for 20 minutes will soothe growing pains for many children; however, this will not stimulate the circulation in the legs as much as a contrast treatment.

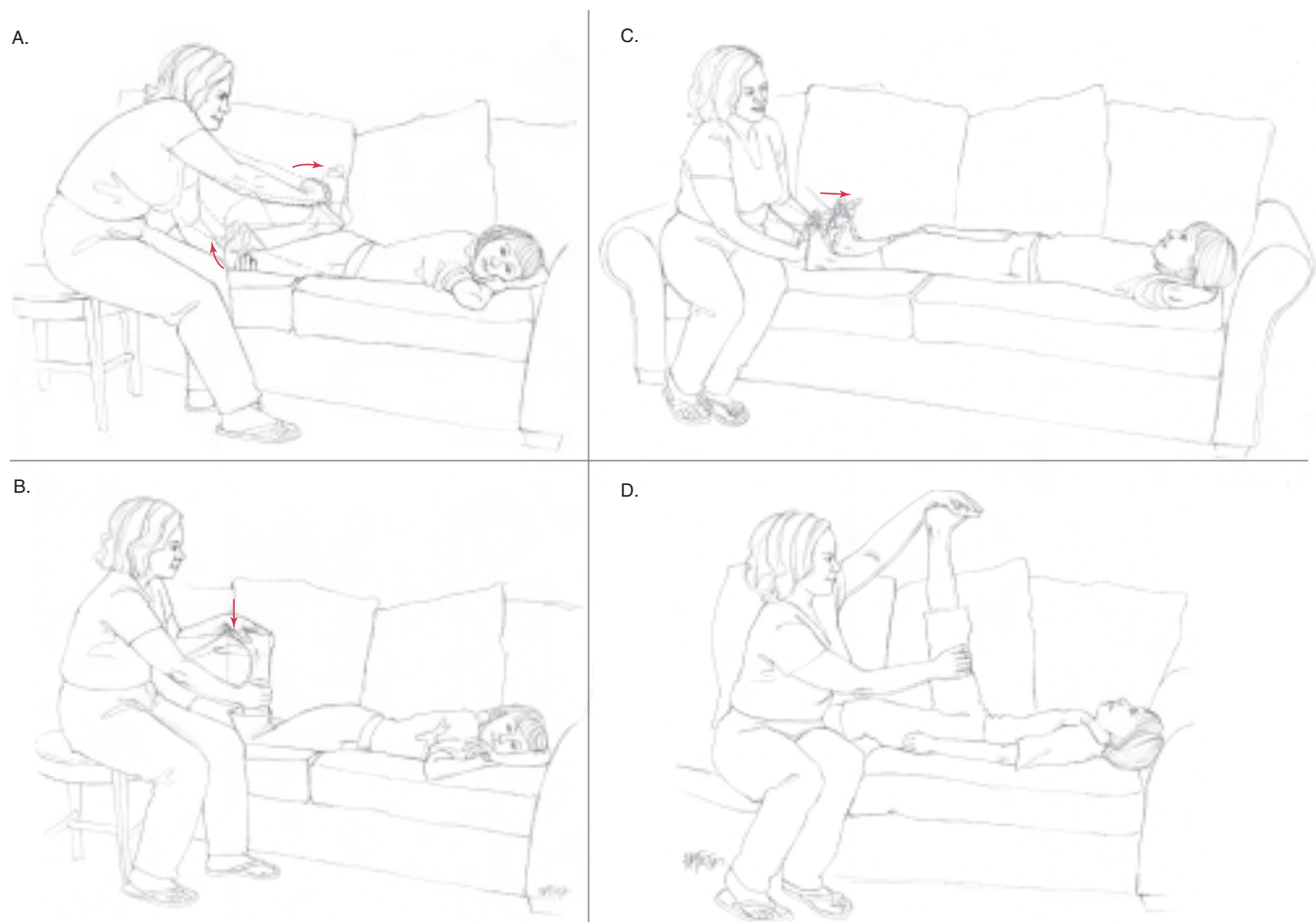


FIGURE 5–8 ■ Stretching Program for Growing Pains. **A**, Stretch for the quadriceps muscle; **B**, Stretch for the gastrocnemius and soleus muscles; **C**, Stretch for the gastrocnemius and soleus muscles; **D**, Stretch for the hamstrings.

CONTRAST TREATMENT

- Step 1. Fill two deep buckets or washtubs with water; one tub with water at 110° F and one tub with water at about 60° F. It may be necessary to add ice cubes to the tap water to reach this temperature.
 - Step 2. Place the child's feet in the hot water for 2 minutes.
 - Step 3. Place the child's feet in the cold water for 1 minute.
 - Step 4. Repeat hot and cold (Steps 2 and 3) twice, for three changes.
 - Step 5. Dry the child's feet.
-

MASSAGE SEQUENCE AND STRETCHING OF THE LEGS (FIGURE 5-8)

- Step 1. Basic relaxation sequence.
 - Step 2. Apply oil or lotion.
 - Step 3. Effleurage the back of the leg, 1 minute (Figure 3-21).
 - Step 4. Rake the back of the leg, 2 minutes (Figure 3-22).
 - Step 5. Thumbstroke the back of the leg, 1 minute (Figure 3-23).
 - Step 6. Effleurage the back of the leg, 1 minute.
 - Step 7. Stretch the quadriceps. Hold for 15 to 20 seconds and repeat 10 times.
 - Step 8. Stretch the gastrocnemius and soleus, with child prone. Hold for 15 to 20 seconds and repeat 10 times.
 - Step 9. Stretch gastrocnemius and soleus, with child supine. Hold for 15 to 20 seconds and repeat 10 times.
 - Step 10. Stretch the hamstrings. Hold for 15 to 20 seconds and repeat 10 times.
 - Step 11. Basic relaxation sequence.
-

HEADACHE

As many as two-thirds of children complain of headaches severe enough to seek medical attention at some time during childhood.¹ More than 40% of all children have had a headache by the age 7 and, by age 15, 20% will have experienced frequent headaches.² In this section, we discuss five common types of headaches. You should never try to diagnose the cause of a child's headache because a headache can have many causes, some more serious than others. The child's family physician should be consulted when a child has repeated headaches or even one severe headache.

DEHYDRATION HEADACHE

Water makes up 60% of the human body and is critical for body function. It is needed to digest and

absorb the nutrients in food; circulate blood; excrete wastes; transport nutrients to cells; carry waste materials and salts to the kidneys; build tissue; maintain body temperature; cushion joints; and keep body tissues, such as the eyes and air passages, moist. Body fluids, such as blood, lymphatic fluid, and cerebrospinal fluid, are 80% water. Nutritionists consider water one of the 6 major nutrients; the others are carbohydrates, fat, protein, vitamins, and minerals.¹

Dehydration, the loss of water in body tissue, is a common and often unrecognized cause of headaches in children and can also be a contributing factor in other types of headaches. Dehydration can also cause daytime fatigue and irritability in children and may contribute to constipation as well. A mere 2% drop in body water can lower mental alertness and trigger fuzzy short-term memory, trouble with basic math, and difficulty focusing on a computer screen or printed page. More severe dehydration can occur when children have high fevers, diarrhea, frequent vomiting, or if they overexercise in hot weather. Major clinical signs of dehydration, including decreased peripheral perfusion, occur at 3-4% body dehydration in young children and indicate admission to the hospital for treatment with intravenous fluid.²

When children are dehydrated, their bodies make less saliva and their mouths get dry, which should be a signal to drink fluids. Unfortunately, many children do not feel thirsty until they have become very dehydrated. Children need to acquire the habit of drinking water, and plenty of it, early in life. The average amount of water a child needs in a single day is:

- five 8-ounce glasses of water for the average 3-year-old (30 pounds)
- six glasses of water for the average 6-year-old (60 pounds)
- six and one-half glasses of water for the average 8-year-old (75 pounds)
- eight glasses of water for the average 12-year-old (90 pounds)

Approach and Goals

When seeing a child who has a headache for any reason, encourage him or her to drink water or rehydration drinks as if he or she had a dehydration headache. At the least, a child who has any type of headache will feel better when well-hydrated and, possibly, the headache will be greatly diminished.

When the author's son was age 10 and weighed 90 pounds, he suffered from excruciating dehydration headaches that were associated with taking hot baths or exercising in hot weather. If he drank two full glasses of water, waited 20 minutes, and drank one more glass of water, his headaches would disappear.

Massage and Hydrotherapy for Dehydration Headaches

DRINKING WATER

As soon as possible, have the child drink one to two glasses of water, depending on body size. Repeat 20 minutes later.

MASSAGE SEQUENCE FOR MUSCLE CONTRACTION HEADACHES

(See page 137)

EYESTRAIN HEADACHES

A full discussion of eye fatigue and strain was given earlier in this chapter. To treat an eyestrain headache, follow the massage and hydrotherapy treatment sequence for eyestrain, page 131.

MIGRAINE HEADACHES

A migraine is a severely painful headache, usually limited to one side of the head and accompanied by vertigo, nausea, hypersensitivity to light, a perception of flashing lights, or other visual disorders. Migraine headaches begin with extreme vasoconstriction of the blood vessels of the brain on the affected side of the head. During this warning phase, children may have feelings of dread, blurred vision, or other sensations indicating they are about to have a migraine. After 2 to 4 hours, the vasoconstriction phase ends and the next phase of a migraine begins. This is an extreme vasodilation of the blood vessels of the brain, and it causes the actual pain of the migraine. The brain is encased in the bones of the skull, and the increased blood in its vessels causes increased pressure on the structures of the brain. This pressure not only causes the pain but also causes the neurologic symptoms; both typically last for several hours. Compared with adults, pediatric migraines are of shorter duration and less likely to have a visual aura, but more likely to be accompanied by nausea and vomiting.¹

Most adults with migraines had their first migraine as a child. Between 4% and 11% of children have migraines headaches,^{1,2} and 70–80% of children with migraines have other family members who experience migraines, as well.³

Many things can trigger migraines in susceptible children. Triggers do not necessarily start a migraine every time they occur, and it may take a combination of triggers to start an attack. For example, if a child is tense and dehydrated and eats a food that is a trigger for him, it may be this combination that precipitates a

headache. High levels of emotional stress, including immediate stress, anxiety, depression and, especially, repressed anger, are potent triggers. Individuals prone to migraines appear to have a generalized hypersensitivity to emotional stress, which they react to with their vascular system.^{3,4}

Other migraine triggers in susceptible children include dehydration, altitude changes, fatigue, fluctuations in hormone levels related to menstruation, certain foods (probably due to food allergies), anxiety, low blood glucose levels, and minor head trauma.³ Upledger believes that malalignment of the cranial bones contributes to migraine as well.⁵ Trigger points in the temporalis, occipitalis, and posterior cervicals muscles are also known migraine inducers.^{6,7} Talcott Bates treated a 9-year-old boy who had “severe protrating headaches accompanied by nausea, vertigo, and vomiting.” His headaches were eliminated with trigger point therapy of his right sternocleidomastoid muscle.⁸

Childhood migraine headaches have been successfully decreased through a variety of nonmedication methods, including progressive relaxation, cognitive coping, self-hypnosis, progressive relaxation, and autogenic relaxation. Some techniques have been more effective than standard migraine medication, indicating that the mind-body connection can be used to good advantage.^{2,9} At the Diamond Headache Clinic in Chicago, Illinois, patients learn different types of biofeedback to control migraines, including increasing the temperature of the hands by visualization (i.e., relaxing at the beach with their hands in hot sand) and using electromyograph biofeedback to reduce tension in different muscle groups. Biofeedback also helps them identify common physical signs of stress, such as tooth grinding or shoulder tightening. Clinic director Seymour Diamond states, “Children with headaches are excellent candidates for biofeedback training. They are more receptive to learning new techniques and have not learned the pain behavior so often seen in adult headache patients.”³

Approach and Goals

Although some therapists have reported success in relieving migraine headaches with deep tissue massage or craniosacral therapy (Nelson C, personal communication, July 2002),¹⁰ when a migraine headache begins, massage treatment will not always relieve it; the longer the migraine continues, the less likely that massage will help. However, the classic hydrotherapy treatment for a migraine headache, a hot footbath, can be effective in the early stages of a headache. By immersing the feet in hot water, the blood vessels dilate and blood is drawn from congested areas. The

hands may be immersed in hot water at the same time. An ice pack on the back of the neck will assist with vasoconstriction of blood vessels to the brain. Point of Interest Box 5–3 describes one woman’s success with hydrotherapy for migraines.

Although massage may not relieve a migraine, children still find massage soothing, especially massage of the upper body. For 4 years, the author treated a boy who had his first migraine at age 10. Some effective treatments for this boy were:

1. A very hot bath, in which only the boy’s lower body was immersed.
2. A hot footbath, combined with the massage strokes for tension headache. In this case, the boy would lie on the treatment table and receive a hot footbath while getting a massage.
3. Massage alone, using the strokes for tension headache.

Typically, these treatments did not eliminate the migraine, but greatly decreased the amount of pain the boy was experiencing, and he found them both soothing and nurturing.

Regular massage therapy, as part of a stress-reduction program, may also help susceptible children prevent tension buildup that can trigger migraines. A study at the Touch Research Institute included adults with migraines. They received ten 30-minute Swedish massages for 5 weeks. This regular massage therapy significantly reduced the number and severity of the study participants’ migraines. Hopefully, this research will be repeated with children.¹¹

Massage and Hydrotherapy for Migraine Headaches

HOT FOOT SOAK AND ICE PACK

- Step 1. Make sure the child is well hydrated.
- Step 2. Give him a 20-minute footbath (temperature, 110° F), combined with a cold compress to the forehead and an ice pack to the back of the neck (Figure 3–52). The child may be seated in a chair; at a counter with his feet in a sink, if he is small enough; or lying down on a treatment table with his knees up and his feet in a basin. The water in the footbath must be kept at 110° F for the entire treatment; as the water cools, more hot water must be added. The hot water should be added carefully so that it is not poured directly on the child’s feet, and the cold compress should be changed every 3 minutes.
- Step 3. Pour cold water over his feet, dry them off, and have him lie down and rest for at least 20 minutes.

MASSAGE SEQUENCE FOR MIGRAINE HEADACHE

Same as for Muscle Contraction Headache, see page 137.

MUSCLE CONTRACTION HEADACHES

In younger children, the cause of head pain is frequently stress. Stress and tension can cause headaches even in 5-year-olds; in older children, most headaches are due to stress. Muscle spasms in the neck and scalp



POINT OF INTEREST BOX 5–3

Hot Water Can Dilate Blood Vessels to Relieve Migraine Headaches

This quotation illustrates the way that the derivative effect of hot water can work:

For years, I have suffered from recurring migraine headaches. I believe I tried every medication and vitamin on the market to ease the migraine pain and all except B complex vitamins gave either no pain relief or caused such unwanted side effects as insomnia and stomach distress. The B complex vitamins eased the pain so that I could at least crawl out of bed, but I had to take the vitamins every few hours round-the-clock for 3 or 4 days just to tolerate the lingering pain. Raising an active 2-year-old girl, I decided I needed more relief.

Somewhere in the jungle of headache books I had read, I learned that, during a migraine, the head’s blood vessels are dilated and swollen and that biofeedback could teach me to move that excess blood down to my hands, constricting the head’s blood vessels back to normal and relieving the headache. Well, that was fine, but where do I go to learn biofeedback? During my search for a biofeedback training center, I was struck by another migraine. I was determined to keep functioning—feeding my daughter, doing the laundry, and washing the dirty dishes. I ran hot, hot water to rinse off my dishes and, while rinsing, I felt my headache ebb. I could feel the blood draining out of my head like the tide washing away from the shore. It dawned on me that I was practicing my own biofeedback, by immersing my bare hands in the hot water. The blood vessels in my hands were dilating to allow blood to rush to the area and carry away the heat. That took the pressure out of my head. The dishes were clean and my headache was gone.

JLT (California), quoted in Bricklin M: Rodale’s Encyclopedia of Natural Home Remedies. Emmaus, PA: Rodale Press, p 256

cause these pains, aggravated possibly by a widening of blood vessels inside the brain. Tension headaches can occur in any part of the head, produce a dull or swollen feeling inside the head, and usually come on slowly. Headaches are often the first symptom of stressful problems at school, at home, or with friends.¹

—R. Pantell

A muscle contraction headache is caused by muscle contraction, spasm, and irritation of trigger points in the face, head, neck, or upper back. Tension in the neck and shoulder muscles can have many causes, as discussed previously in this chapter, and emotional stress may combine with this tension to produce a headache.

Approach and Goals

Hydrotherapy treatments can increase circulation to the neck and head muscles. Massage treatment, by relieving muscle tension, is frequently successful at relieving the pain of a muscle contraction headache. It can also provide nurturing, comforting personal contact.

Massage and Hydrotherapy for Muscle Contraction Headaches

These treatments are especially appropriate to teach to parents because they will often be with the child when he has a headache.

COLD APPLICATION TO THE NECK OR SCALP

Choose one:

1. Run cold water in the sink. Stand the child in front of the sink, on a stool if necessary, and put his head in the sink. Let the water run over his scalp for 3 minutes. Towel the hair dry. It will be difficult to persuade most children to tolerate the cold water; a more tolerable treatment is an ice application.
2. Place an ice pack on the back of the child's neck for 10 minutes.

MASSAGE SEQUENCE FOR TENSION HEADACHE

Positioning:

This sequence can be done sitting at a treatment table or on the floor, while you sit cross-legged at the child's head.

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Apply oil or lotion.
- Step 3. Effleurage shoulder and neck 10 times (Figures 3-26 and 3-27).
- Step 4. Perform diagonal neck stroke, 10 times (Figure 3-28).
- Step 5. Effleurage shoulder and neck, 10 times.

- Step 6. Petrissage scalp, 1 minute (Figure 3-29).
- Step 7. Knead the upper trapezius (Figure 3-17). Knead each side for 30 seconds or more. Myofascial trigger points in the fibers of the upper trapezius are sources of temporal headache, tension neckache, and referred pain to the side of the neck, mastoid process, temple, occiput, and back of the eye orbit. Of all the muscles in the body, the trapezius is most likely to harbor trigger points.²
- Step 8. Perform diagonal neck stroke, 10 times.
- Step 9. Pressure points on the base of the occiput (Figure 5-6).
- Step 10. Effleurage shoulder and neck, 10 times.
- Step 11. Basic relaxation sequence.

SINUS HEADACHE

Sinus headaches are caused by sinus congestion, and they may be either acute or chronic. They can also be caused by inflammation resulting from allergies or infections, which often develop in the later stages of a cold.

Approach and Goals

Massage and hydrotherapy can reduce sinus congestion and increase circulation to the face and sinuses, relieving the pain of congestion.

Massage and Hydrotherapy for Sinus Headache

HYDROTHERAPY FOR SINUS CONGESTION

See treatments for sinus congestion described in the common cold section of this chapter. A hot foot soak may be given to the child on the treatment table while he is receiving massage.

MASSAGE SEQUENCE FOR SINUS HEADACHE

Positioning:

Position yourself as for a head massage.

- Step 1. Basic relaxation sequence.
- Step 2. Apply oil or lotion.
- Step 3. Perform diagonal neck stroke (Figure 3-28). Repeat 20 times.
- Step 4. Pressure points on the upper trapezius (Figure 5-7).
- Step 5. Petrissage scalp (Figure 3-29).
- Step 6. Perform forehead and eye circles (Figures 3-30 and 3-31).
- Step 7. Put your thumbs along either side of the nose, level with the eyes; stroke slowly and firmly down to the bottom of the nose. Repeat 10 times.
- Step 8. Pressure points around the eyes (Figures 5-1 and 5-2).

- Step 9. Pressure points on the side of the nose. Begin just below the bottom of the eye socket. Press with your thumbs on either side of the nose just below the eye socket, as if you were trying to touch them together. Use gentle to moderate pressure, as firm as the child can tolerate. Press at a second point in the middle of the nose and a third point at the bottom.
- Step 10. Perform forehead and eye circles. Repeat 10 times.
- Step 11. Basic relaxation sequence.



If the child has a sinus infection (not just sinus inflammation) or a fever, massage is contraindicated.

INSOMNIA

Insomnia is a common problem for children and can be a sign of stress, anxiety, or depression. In children who are highly active and have trouble falling asleep in general, however, insomnia is not necessarily a sign of stress but may simply reflect a nervous system that is “wired” differently. When these children are overtired, they have great difficulty falling asleep; allowing them to stay up too long will make it difficult for them to unwind and fall asleep. To go to sleep easily, all children need regular bedtimes and environments that are calm and quiet.

APPROACH AND GOALS

Hydrotherapy and massage are soothing, nurturing, relaxing, and helpful for children with sleep problems. Bedtime rituals help a child learn to gradually slow down and, when taught to parents, massage and hydrotherapy can be incorporated into them. Regular therapy can also be part of a stress-reduction program for a child with insomnia who is tense, anxious, or depressed.

MASSAGE AND HYDROTHERAPY FOR INSOMNIA

WARM BATHS

Have the child take a warm bath (temperature, 100° F) for 20 minutes.

MASSAGE SEQUENCE FOR INSOMNIA

Positioning:

Begin with the child lying in the prone position.

Step 1. Basic relaxation sequence (page 70).

- Step 2. Apply oil or lotion.
- Step 3. Perform back effleurage (Figure 3–2). Repeat 20 times.
- Step 4. Ask the child to turn over into the supine position and reapply oil or lotion.
- Step 5. Perform shoulder and neck effleurage (Figures 3–26 and 3–27). Repeat 10 times.
- Step 6. Perform diagonal neck stroke (Figure 3–28). Repeat 10 times.
- Step 7. Face effleurage (Figures 3–32 and 3–33). Repeat 10 times.
- Step 8. Scalp petrissage (Figure 3–29). Repeat for 1 minute.
- Step 9. Pressure points around the eyes (Figures 5–1 and 5–2).
- Step 10. Shoulder and neck effleurage. Repeat 10 times.
- Step 11. Basic relaxation sequence.

LEG CRAMPS

Muscle cramps are painful, but short-lived, muscle spasms. Leg cramps in the hamstrings, calves, or feet muscles can be painful. Leg cramps that occur at night (nocturnal leg cramps) are clearly associated with trigger points in the gastrocnemius muscle. One study found that 50–75% of adults and 16% of healthy children experience these cramps. Many people who suffer from painful leg cramps may be deficient in calcium and/or magnesium. Dehydration and electrolyte imbalance may also contribute to cramps in the calf.¹

APPROACH AND GOALS

When the cramp occurs, stretching the cramping muscle and then massaging it as soon as the cramp has subsided is an effective emergency treatment. To prevent cramping, do massage regularly to increase the circulation to leg muscles and decrease muscle tension. Teach the child or his parents to do the stretches located in the “Growing Pains” section daily. Depending on the child’s age, the parents may need to supervise this stretching. If massage and stretching are not effective, his parents may wish to evaluate a need for supplementation.

MASSAGE AND HYDROTHERAPY FOR LEG CRAMPS

WARM SOAKS

There is no time for hydrotherapy when the child has a cramp; however, soaking the area in a hot bath and then stretching it can help prevent future cramping.

MASSAGE FOR LEG CRAMPS

- Step 1. Have the child lie face down on a bed or the floor. There is no time to use the basic relaxation sequence or to apply oil or lotion.
 - Step 2. In the event of a hamstring, calf, or foot muscle cramp, stretch the cramping muscle by engaging the antagonistic muscle. For example, in the case of a gastrocnemius cramp, ask the child to contract the tibialis anterior.
 - Step 3. When the cramp subsides, effleurage and knead the muscle briefly, using moderate pressure.
 - Step 4. When the cramp is gone, do a few more warming strokes, gradually lightening your pressure.
-

LOWER BACK PAIN

Children can have sacroiliac dysfunction and lower back pain; however, when younger children complain of pain in the lower back, it is usually a result of injuries, such as falls on the coccyx.¹ Low back pain is not a common complaint in children before adolescence.² There is probably a combination of factors that causes adolescents to experience more lower back pain than younger children, including:

1. Previous musculoskeletal injuries, resulting in muscular compensations or in damage to the spine. Damage may often show up only after a child goes through the adolescent growth spurt. Disc protrusions and degeneration are frequent in adolescents. Researchers, using magnetic resonance imaging (MRI) to evaluate pain and disc degeneration in 15 year olds, found that 16% of those with no low back pain had disc protrusions and 26% of those with low back pain had disk protrusions. In a follow-up study 4 years later, repeat MRIs of the same two groups of young people, now age 19, indicated increased rates of disk protrusion and degeneration.^{3,4}
2. Muscle strain. Injuries to the low back, including lifting injuries and falls, may strain the supporting muscles alongside the spine, which may cause them to spasm. Adolescent athletes who are playing at a high level, may have extreme tension in the muscles of the lower back. The author has treated many adolescents who developed significant back pain after beginning athletics early in childhood and competed constantly for many years.
3. Emotional stress. The lower back can become the target organ for the expression of emotional conflicts. The contribution of stress to low back pain is underappreciated.⁵ Children, as well as adults, may store emotional tension in the mus-

cles of their low back. Psychiatrist David Williams successfully treated a 13-year-old boy with emotionally based, severe lower back pain by teaching him self-hypnosis. The boy learned to repeat phrases such as “Cooped-up feelings can cause tension” and “By relaxing, I can reduce the tension and eliminate the pain.”⁶ Any time a child presents with back pain that is not from an acute injury, stress may be a factor. Information about the contribution of stress to lower back pain can be shared with the parent and child, without intruding on their privacy, by telling them that stress can contribute to lower back pain for some children.

4. Structural or postural problems. For example, if one leg is shorter than the other, it can contribute to trigger points and muscle spasm in the muscles of the lower back.

APPROACH AND GOALS

Hydrotherapy can relieve muscle spasm and increase circulation to the muscles of the lower back. This greatly enhances the beneficial effects of massage for lower back pain. Ice massage, for example, can be effective in the acute stage of a low back strain. It will often do more to relieve spasm than any medication. Contrast treatments improve the circulation to the lower back. Heat alone should never be used in the acute phase of a lower back injury.

A salt glow will improve the circulation to the back muscles and remove the most superficial layer of tension in the lower back; children find it novel and interesting, as well. It can be done in the acute stage of injury because heat is not used on the area. Massage can release tension and improve circulation in the lower back.

MASSAGE AND HYDROTHERAPY FOR LOWER BACK PAIN

Choose one to perform prior to massage:

ICE MASSAGE

Use an ice cup (see page 91) to massage the painful area and the surrounding 4 inches. Continue ice massage for about 8 minutes.

CONTRAST TREATMENT

- Step 1. Apply a moist heating pad or Hydrocollator pack to the lower back for 3 minutes.
- Step 2. Apply an ice pack to the lower back or do ice massage for 1 minute.

Step 3. Repeat hot and cold twice, for a total of three changes.

SALT GLOW OF THE LOWER BACK (FIGURES 3-53 AND 3-54)

Positioning:

The child's back should be uncovered, with the underwear moved down to expose the iliac crest; the gluteal cleft is covered. To prevent salt crystals from getting in the underwear, tuck in a towel. Follow directions for a local salt glow (page 93).

MASSAGE SEQUENCE FOR LOWER BACK PAIN

- Step 1. Basic relaxation sequence (page 70).
- Step 2. Apply oil or lotion.
- Step 3. Back effleurage (Figure 3-2). Use firm pressure, especially in the lower back area. Repeat the full stroke 20 times.
- Step 4. Thumbstroke the lower back (Figure 3-19) slowly and thoroughly, working as deeply as possible without causing discomfort to the child. Thumbstroke for approximately 2 minutes.
- Step 5. Knead the buttock muscles, through the underwear, using medium pressure, from the sacrum out to the side of the hip. Knead each buttock for about 1 minute (Figure 3-20).
- Step 6. Pressure points along the posterior iliac crest (Figure 5-9). Press against the back of the iliac crest, beginning just lateral to the spine. Use your thumb and press downward (toward the feet).

This will contact the large back and gluteal muscles that attach on the posterior iliac crest. Do four points along the hipbone, each one further away from the spine. Use the maximum pressure that the child finds comfortable. Do first one to the posterior iliac crest, and then cross to the opposite side and do the other.

- Step 7. Pressure points on the sacrum (Figure 5-10). If working on the floor, kneel next to the child opposite his or her lower back. Beginning at the coccyx, press with the flat of your thumbs along the side of the vertebrae. Begin with slight pressure and gradually increase to the point of soreness, but not pain. Back off a bit, then hold for 10 seconds. Go from the tailbone up the sacrum to the level of the waist, moving upward about a thumb's width each time.
- Step 8. Knead the buttock, same as above.
- Step 9. Back effleurage, 10 times.
- Step 10. Basic relaxation sequence.



Any child with severe or chronic lower back pain should be examined by a physician to rule out any conditions that might contraindicate massage.

MENSTRUAL CRAMPS

Menstrual cramps are mild to severe cramping pains in the pelvic and abdominal areas. They can last from a few minutes to a few days, just prior to or at the onset of menstruation. For some girls, pain causes several days of disability each month because the pain is severe enough to interfere with activities. Menstrual



FIGURE 5-9 ■ Pressure Points Along the Posterior Iliac Crest. These points are useful in low back pain massage.



FIGURE 5-10 ■ Pressure Points on the Sacrum. These points are useful in massage for low back pain and menstrual cramps.

pain or dysmenorrhea is caused by a combination of uterine muscle spasm, ischemia, referred pain to groin and low back dermatomes, and mechanical tugging on uterine ligaments. Heredity, stress, diet, constipation, and many other factors contribute to this condition.

APPROACH AND GOALS

Hydrotherapy, in the form of a sitz bath, can relieve the pain of menstrual cramps because it increases circulation and relaxes the muscles in the pelvic area. A sitz bath is a partial bath, involving only the pelvic region. Traditionally, a sitz bath was given in a specially constructed tub that allowed only the pelvic region to be submerged in water, but a regular bathtub may be used if the girl puts her feet out of the tub during the treatment. Sitz baths may be given with either hot or cold water, or as a contrast treatment of heat followed by cold. A hot sitz bath followed by an application of cold water, such as a cold friction to the area, will stimulate the circulation, although not as much as a hot bath followed by a cold bath. (However, it may be difficult, if not impossible, to

persuade an adolescent girl to plunge her pelvic area into cold water after a hot bath!) Contrast treatments to the pelvic area can also increase circulation and relieve pain.

Massage can be an excellent emergency treatment to relieve menstrual cramps in adolescent girls; the massage sequence for menstrual cramps given below may give relief for a few minutes to a few hours. Regular massage may also be effective in reducing menstrual symptoms. In a Touch Research Institute study, adult women receiving a 30-minute Swedish massage, twice a week for 5 weeks, had less menstrual pain, less water retention, and a marked improvement in mood.¹

MASSAGE AND HYDROTHERAPY TREATMENTS FOR MENSTRUAL CRAMPS

HOT SITZ BATH WITH COLD FRICTION

Hot sitz bath: Have the girl take a 15-minute hot bath with her feet out of the water. The water should be about 105° F, depending on individual tolerance. When she gets out of the bath, quickly rub her lower abdomen with a washcloth or terrycloth mitt that has been wrung out in ice water. This treatment may be done by the girl or her mother at home before coming to your facility for a massage treatment or at your facility if there is access to a bathtub.

CONTRAST TREATMENT TO THE PELVIC AREA

- Step 1. Apply a moist heating pad or Hydrocollator pack to the lower abdomen for 3 minutes.
- Step 2. Apply an ice pack to the lower abdomen for 1 minute or quickly rub the lower abdomen with a washcloth or terrycloth mitt that has been wrung out in ice water.
- Step 3. Repeat hot and cold (steps 1 and 2) twice, for three changes.

MASSAGE SEQUENCE FOR MENSTRUAL CRAMPS

Positioning: Stand at the child's right side, opposite the waist.

- Step 1. Basic relaxation sequence.
- Step 2. Apply oil or lotion.
- Step 3. Abdominal effleurage (Figure 3-36). Use gentle pressure. Repeat 20 times.
- Step 4. Pressure points on the pubic bone (Figure 5-11). Begin at the center of the pubic bone. Using the middle finger of your right hand, press directly on top of the bone. Go just to the point of soreness (not pain), back off a bit, and hold for 10 seconds.

Then move outward approximately one-half inch, until you find a sensitive spot, and hold for 10 seconds. Be gentle; these points can be extremely sensitive during the menses. Move outward another one-half inch and hold, then one more time, for a total of four points. Cross over to the left side, beside the left hipbone, and repeat, using the middle finger of your left hand.

Step 5. Abdominal effleurage. Repeat 20 times.

Step 6. Pressure points on the sacrum (Figure 5–10).

Step 7. Basic relaxation sequence.

MUSCLE WEAKNESS

Muscle weakness can be a temporary condition caused by fatigue, minor illnesses, low blood glucose levels, dehydration, or emotional stress. It can also be a chronic condition when the child lacks the muscle strength and endurance to carry out the normal activities of daily living. Chronic muscle weakness is a feature of different disabilities, including muscular dystrophy, spinal cord injury, polio, stroke, and certain types of cerebral palsy. In this section, we discuss the chronic type of muscle weakness caused by these disabilities. One problem arising from muscle weakness is the chronic tension that can develop in children's muscles when they are constantly straining to move or substitute stronger muscles for weaker ones.

APPROACH AND GOALS

Both massage and hydrotherapy can be beneficial for children with muscle weakness. For example, exposure to cold can stimulate the action of extensor muscles. A weak or paralyzed hand or foot can be

immersed in cold water and exercised while the strength of the muscles is stimulated. A contraction will be noticed at the moment of immersion, even if it is weak or inhibited by spasticity. The first contraction will be the strongest, and the successive contractions, which occur each time the part is immersed in cold water, will be weaker. However, the extensors will be stimulated and the flexors inhibited for about 20 minutes following the treatment.¹ This is the time to have children do strengthening exercises. Massage after the hydrotherapy and exercise session can ensure that children's muscles have not been strained by contractions that are too vigorous. Strengthening exercises recommended by the physical therapist can also be incorporated into a massage treatment, as long as the session is enjoyable and not extremely taxing. Alternating massage and visualizations with muscle strengthening helps the child relax and recharge, and the variety will maintain interest. Try to make the session as much fun as possible and give positive reinforcement for even small improvements.

Dr. Meir Schneider has developed special massage techniques to develop muscle tone (see Muscular Dystrophy section). He recommends having children visualize doing a movement as a way to augment the strengthening. It is important that they not be asked to do a movement that would clearly be impossible, but have them try one that they can barely do. Have them picture the movement as smoother, easier, or lighter.² Exercising in water can help children develop muscle strength without fighting gravity and can be combined with Watsu massage techniques.³

Whole-body massage is recommended for children with any type of chronic muscle weakness to reduce chronic tension that may have developed as they try to compensate for deficiencies in their ability to move.



FIGURE 5–11 ■ Pressure Points on the Pubic Bone. These points are useful in massage for menstrual cramps.

COLD WATER IMMERSION AND EXERCISE

- Step 1. Begin with a large bowl or bucket of water (temperature, 35° to 40° F). Ice cubes will be needed to achieve this temperature. Make sure that the child is comfortably warm before beginning the cold water immersion.
 - Step 2. Immerse the part in the water for 3 seconds.
 - Step 3. Remove the body part out of the water and have the child do isometric contractions or contractions against resistance for 30 seconds. If she becomes fatigued, stop the exercises until after the next cold water immersion.
 - Step 4. Repeat Steps 2 and 3 two to five times.
-

MASSAGE

Use Swedish massage of the part, using the techniques in Chapter 3 and conclude with lots of tapotement, which can be more stimulating to muscle tone. If the child is not fatigued, more strengthening exercises may be performed at this time. The stimulating effect of the cold water will last 10 to 20 minutes.

NECK AND SHOULDER TENSION

Tension in the neck and shoulder muscles is common in children as well as in adults and is probably the most common complaint for which adults seek massage therapy. Because chronic neck and shoulder tension is such a widespread problem, this section goes into greater detail about its causes than of many discomforts in this chapter. Although massage is an effective short-term treatment for chronic neck and shoulder tension, true resolution may involve referring the child to an appropriate specialist, such as a counselor, dentist, or optometrist. Parents will be grateful to learn what can address the cause of their children's discomfort. Common causes of neck and shoulder tension include:

- A poor position in utero. This can activate trigger points in the neck and shoulder muscles and cause such problems as torticollis, which is a result of the child's head being twisted to one side for an extended period (see Torticollis in this chapter, page 147).
- Birth trauma. This can cause strain to the muscles and bones of the neck and upper spine (see Chapter 4).
- Falls and motor vehicle accidents. These are the two most common injuries to children, and can establish patterns of neck and shoulder tension.

Falling on the head or striking it by diving into shallow water, for example, can activate trigger points in the posterior cervical muscles.¹

- Malocclusion of the teeth and jaw (improper fitting together of the upper and lower teeth). In the United States, 50% of children ages 8 to 11 have well-aligned incisors; the rest have varying degrees of malalignment and crowding, and 14% have severe malocclusion. This percentage increases during adolescence until adulthood, when only 34% have well-aligned incisors.² Malocclusion may have many causes. Injuries to the jawbone or teeth can cause malocclusion and one-half of all children have a traumatic injury to their baby or permanent teeth by the time they graduate from high school. Massage therapist and craniosacral dentist Clint Nelson believes that a great percentage of malocclusions are a consequence of poor alignment of the cranial bones (Nelson C, personal communication, July 2002). Poorly aligned teeth cause children to use extra muscular effort to chew their food and may change the way children swallow, leading to teeth clenching and grinding as a response to stressful conditions.² Dental malocclusion can overload masticatory (chewing) muscles, such as the pterygoids, temporalis, and masseters, and perpetuate their trigger points.¹ When the masseters are chronically overcontracted, they fatigue; this contributes to a forward head posture, which leads to tension in the upper trapezius, sternocleidomastoid, levator scapulae, scalene, and upper pectoral muscles. For neck and shoulder tension caused by problems with the bite, massage will be an effective short-term solution, but the long-term solution may be treatment of the malocclusion by a dentist (Nelson C, personal communication, July 2002).
- Eyestrain caused by too much reading, working at a computer, or other near-vision tasks, or straining to see because of vision problems causes compensations in many of the neck and shoulder muscles. Some of the affected muscles may be the sternocleidomastoid, occipitalis, suboccipital, or erector spinae muscles (see the section on Eyestrain, page 128).
- Poor ergonomics while working at a computer or while playing video games. The average child spends at least several hours a day sitting in front of a computer screen. Extended forward posture of the head may cause tension in the upper trapezius, scalene, sternocleidomastoid, posterior cervical, and pectoral muscles. A position with the head turned to one side and projected forward can activate trigger points in the splenius cervicis muscle; typing with the head and neck

turned toward the side of the keyboard can activate trigger points in the levator scapulae.¹

- **Compensations for postural imbalance elsewhere in the body.** Chronic neck and shoulder tension can result from trying to maintain good posture when there is a structural problem. For example, when one leg is shorter than the other, the pelvis tilts down on the side of the short leg and the shoulders are tilted as well. Then, to maintain the eyes at an even level, the child must tilt his or her head, and this can activate trigger points in the sternocleidomastoid, scalene, levator scapulae, and upper trapezius muscles.¹
- **Emotional stress.** Deep tension in the muscles of the entire upper body can be caused by emotional stress, especially anxiety. When the child is under stress, trigger points may be aggravated from other causes discussed above.

APPROACH AND GOALS

Massage and hydrotherapy are excellent short-term treatments for chronic neck and shoulder tension because they relax the muscles of the head and neck and increase local circulation. They are also excellent for acute neck and shoulder tension resulting from physical strain, such as unaccustomed exercise.

MASSAGE AND HYDROTHERAPY FOR NECK AND SHOULDER TENSION

MOIST HEAT APPLICATION

With the child lying prone, place a hot water bottle, moist heating pad, or Hydrocollator pack on the upper back and neck for 5 to 10 minutes.

CONTRAST TREATMENT

- Step 1. Have the child prone and place a hot water bottle, moist heating pad, or Hydrocollator pack on the child's upper back and neck for 5 to 10 minutes.
- Step 2. Have the child turn over. Place an ice pack under the back of the neck for 1 minute. Make sure the rest of the child's body is warm; the ice pack should not cause chilling.

MASSAGE SEQUENCE FOR NECK AND SHOULDER TENSION

- Step 1. Basic relaxation sequence.
- Step 2. Apply oil or lotion.
- Step 3. Shoulder and neck effleurage (Figures 3–26 and 3–27). Repeat 20 times.

- Step 4. Diagonal neck stroke (Figure 3–28). Repeat 20 times.
- Step 5. Shoulder and neck effleurage, repeat three times.
- Step 6. Scalp petrissage (Figure 3–29).
- Step 7. Shoulder and neck effleurage, repeat three times.
- Step 8. Knead the upper trapezius (Figure 3–17). Perform for 1 minute.
- Step 9. Pressure points on the upper trapezius (Figure 5–7).
- Step 10. Pressure points on the occiput (Figure 5–6).
- Step 11. Shoulder and neck effleurage, repeat three times.
- Step 12. Basic relaxation sequence.

SORE THROAT

A sore throat is one of the most common complaints of childhood. Frequent and recurrent sore throats are especially common between ages 5 and 10. (There is no evidence that removing the tonsils helps decrease sore throats.¹) A sore throat can be caused by anything that irritates the sensitive mucous membranes at the back of the throat and mouth, including viruses, bacteria, allergies, mouth breathing, excessively dry air, and overuse of the voice. Fully 90% of childhood sore throats are caused by viruses, which, of course, cannot be treated with antibiotics and must run their course.

APPROACH AND GOALS

Massage is contraindicated in the acute stage of any bacterial or viral sore throat. However, parents may wish to perform the following treatments when their child is recovering from strep throat. Massage and hydrotherapy treatments may not only relieve the discomfort and pain of sore throat in the subacute stages of a viral or bacterial infection by increasing blood circulation and improving lymphatic drainage, but also may speed healing. Children often feel immediate and dramatic relief of sore throat pain. Massage and hydrotherapy are also useful for simple sore throats that are not caused by an infection, and for tension and stress in the muscles of the anterior neck.

MASSAGE AND HYDROTHERAPY FOR SORE THROATS

Choose one hydrotherapy treatment for the child prior to massage:

HYDROTHERAPY

1. Gargle using warm saline (½ teaspoon of salt to 1 cup of warm water) for 5 to 10 minutes, four times a day. This is an effective treatment for children; however,

smaller children may not be able to gargle without choking on the water.

2. Drink plenty of water to keep the throat moist.
3. Contrast Treatment

Step 1. Have the child lie supine. Fold a washcloth into a narrow strip, and dip it into a bowl of water at 110° F. Wring out cloth and place on the child's throat. A small, moist heating pad may also be used. Leave the hot application on the throat for 3 minutes. If the washcloth appears to be cooling off, replace it with another cloth after 2 minutes.

Step 2. Fold another washcloth into a narrow strip and dip it into a bowl of very cold water (add ice cubes to the water to make it as cold as possible). Wring out and cover the throat. Leave the cold application on for 1 minute.

Step 3. Repeat hot and cold (steps 1 and 2) twice, for three changes.

MASSAGE SEQUENCE FOR SORE THROAT

Positioning: Have the child lay supine, with a pillow under his head

- Step 1. Basic relaxation sequence.
 - Step 2. Passive touch on the shoulders or throat.
 - Step 3. Superficial effleurage of the sternocleidomastoid.
 - Step 4. Pressure points on the sternocleidomastoid muscle (Figure 5-5).
 - Step 5. Basic relaxation sequence.
-



If the sore throat is severe; persists for more than 2 days; or is accompanied or followed by fever, headache, rash, nausea, or vomiting, the child's physician should be consulted promptly. These may be symptoms of strep throat, a serious bacterial illness for which antibiotics are customarily prescribed. Left untreated, strep throat can lead to serious complications, including rheumatic fever. It is also highly contagious.

SORENESS AFTER EXERCISE

Muscle soreness is generally felt 24 to 36 hours after strenuous exercise. Working muscles very vigorously results in microscopic tears to muscle fiber, local swelling, and pain messages being sent from the nerves in the muscles to the brain.

APPROACH AND GOALS

When a child experiences muscle soreness after strenuous exercise, gentle movement, Epsom salt baths, and massage will increase the circulation to the muscle,

relieve swelling and pain, and help the muscle repair. Use caution when massaging a sore area, so that massage does not become unpleasant or stressful for the child.

MASSAGE AND HYDROTHERAPY FOR SORENESS AFTER EXERCISE

Choose one hydrotherapy treatment to do prior to massage:

HYDROTHERAPY

1. Ice massage. Use an ice cup (see page 91) to massage the painful area and the surrounding 4 inches. Do not press hard. Continue ice massage for about 8 minutes.
 2. Epsom salts bath. For an adult, use 1 cup Epsom salts in a tub of warm water. Adjust the amount of Epsom salts to the size of the child; for example, use 1 cup salts for a 150-pound adult, ½ cup for a 75-pound child, and ⅓ cup for a 50-pound child. The temperature should be 100° to 105°F—whatever is comfortably warm to the child. Have the child stay in the tub for at least 20 minutes.
-

MASSAGE FOR SORENESS AFTER EXERCISE

Perform effleurage and thumbstroking of the sore area for 10 minutes. If the area is tender, begin with light pressure and gradually increase pressure to the child's tolerance.

TENSION STOMACHACHE

When we refer to recurrent abdominal pain, we are talking about repeated bouts of abdominal pain for which no explanation is obvious. Somewhere between 10–20% of all children will complain of these recurrent problems. The most common cause of abdominal pain in adults and children alike is stress. It is only natural for us to react to the environment in which we live. A bad day, the loss of a pet, or an argument with a friend would create stress in all of us. It is a common misconception that children's feelings are not as complex and sensitive as adults. Children become just as angry, anxious, and depressed as we do.¹

Recurring abdominal pain is one of the most common somatic complaints of children, although a specific organic cause is found in only 5–10% of those children.²

In some children, recurring stomachaches can be linked to family factors. For example, two studies of 3 year olds found a link between stomachaches in the child, maternal depression, maternal health problems, and parental marital problems. Temper tantrums and a high level of fearfulness were also associated with recurrent stomachaches.^{3,4}

One study admitted children from ages 6 to 16 to a pediatric gastroenterology clinic for evaluation of abdominal pain. The children had all experienced at least three episodes within 3 months of abdominal pain severe enough to interfere with their activities. Researchers found that these children tended to be more anxious and to internalize their emotions more than the average child. In addition, a high percentage of the children had experienced the death of a family member or friend shortly before their pain began. Children in this study were better able to cope with their pain when they were able to understand its connection with emotional stress.²

APPROACH AND GOALS

Massage therapy can provide immediate relief for some tension stomachaches, and regular massage may release chronic tension and associated emotional stress and teach the child to relax. Massage therapy may be especially important in treating stress-related abdominal pain because one-third to one-half of children experiencing such pain continue to have pain as adults.² Giving them tools to cope with the tendency to store stress in the abdomen may help them for life.

MESSAGE AND HYDROTHERAPY FOR TENSION STOMACHACHE

MOIST HEAT APPLICATION

Place a hot water bottle, moist heating pad, or Hydrocollator pack on the stomach for 10 minutes.

MESSAGE SEQUENCE FOR TENSION STOMACHACHES

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Apply oil or lotion.
- Step 3. Abdominal effleurage (Figure 3–36).
- Step 4. Abdominal smoother. Begin with one palm on the upper abdomen, just below the ribs. Do not push on the xiphoid process. Glide to the bottom of the abdomen using gentle, even palm pressure over the entire area. Repeat with your other hand. Continue alternating hands in a slow, steady rhythm. Do 20 times.
- Step 5. Abdominal effleurage, 20 times.
- Step 6. Abdominal smoother, 20 times.
- Step 7. Abdominal effleurage, 20 times.
- Step 8. Basic relaxation sequence.



There are many causes of abdominal pain. If a child is suffering from recurring abdominal pain, the family physician should be consulted to rule out any pathology.

TIRED FEET

This section presents a simple treatment for muscular fatigue of the feet, but not for conditions caused by poor alignment, bad shoes, or any type of pathologic condition. It is most appropriate for children who have been walking or running long distances or competing in games that involve a lot of running, such as basketball or soccer.

APPROACH AND GOALS

Competitive runners frequently use hydrotherapy to ease muscular fatigue and rejuvenate muscles. Unfortunately, no studies have been done on the effect of hydrotherapy on the muscles of the feet; however, the leg muscles, many of which insert on the feet, have been studied. One study found that cold baths greatly increased the strength of leg muscles. Subjects were given leg baths (temperature, 54° F) for 30 minutes. Each subject was tested for leg strength 11 times during the 30 minutes, as well as every 20 minutes for 3 hours after the treatment as they were relaxing. Their leg muscles had increased in strength during the cold bath and afterward for as long as 6 hours. The researchers felt that the increased strength was a result of increased blood flow to the deep muscles caused by restriction of peripheral blood flow during the treatment.¹

Massage can bring great relief for feet that ache or are fatigued from vigorous exercise. If a young athlete is taking a rest and then going back on the field, massage can have a rejuvenating effect by improving the circulation and relieving muscle tension. A study at the University of North Carolina found that a 10-minute leg massage after vigorous leg weight lifting was more successful at reducing muscular fatigue than just sitting quietly.² Massage of the feet feels soothing, improves circulation, and stretches tight muscles, especially those of the arch. Because tension and fatigue in the leg muscles are often related to the condition of the feet, leg massage will also help relieve fatigue in the feet muscles. Massage of the fronts or backs of the legs could easily be done along with the sequence for the feet. Refer to massage for the front and back of the legs discussed in Chapter 3.

MASSAGE AND HYDROTHERAPY FOR TIRED FEET

CONTRAST TREATMENT

- Step 1. Fill two deep buckets or washtubs with water, one hot and one cold (put in a few ice cubes).
- Step 2. Put the child's feet in the hot water for 3 minutes.
- Step 3. Put both feet in the cold water for 1 minute.
- Step 4. Repeat steps 2 and 3.
- Step 5. Repeat steps 2 and 3.
- Step 6. Dry the child's feet.

MASSAGE SEQUENCE FOR TIRED FEET

Positioning:

Position yourself as for massaging the front of the leg. Begin with the right foot.

- Step 1. Basic relaxation sequence (see page 70).
- Step 2. Apply oil or lotion.
- Step 3. Foot friction (Figure 3-47). Repeat for 30 seconds or longer.
- Step 4. Thumbstroke the top of the foot (Figure 3-48). Thumbstroke for at least 1 minute.
- Step 5. Foot friction, 30 seconds.
- Step 6. Stretch the sole of the foot. Hold underneath the heel with your right hand and grasp the toes with your left hand. Bend them back firmly but gently. Hold for 10 seconds.
- Step 7. Knuckling the sole. Make a loose fist with your right hand. Hold the top of the foot with your left hand. Rub rapidly up and down the sole from heel to great toe, using firm pressure. Continue for 15 seconds.
- Step 8. Rotate the ankle (Figure 3-13F). Hold the heel with the left hand. Using the heel of the right hand against the ball of the foot, gently rotate the foot, making a large circle. Encourage the child to relax and try to not help make circles. Do 10 slow circles, reverse direction and do 10 more.
- Step 9. Knuckling the sole, 15 seconds.
- Step 10. Foot friction, 30 seconds.
- Step 11. Stretch and stroke each toe (Figure 3-49).
- Step 12. Foot friction, 30 seconds or longer.
- Step 13. Basic relaxation sequence.
- Step 14. Move to the left foot and repeat, using the opposite hands.

TORTICOLLIS

Torticollis means *twisted neck*. In this condition, there is an exaggerated lateral flexion of the child's head to one side, and a rotation of the head to the opposite side (Figure 5-12). The most common cause of torticollis is fibrous shortening of the sternocleidomastoid

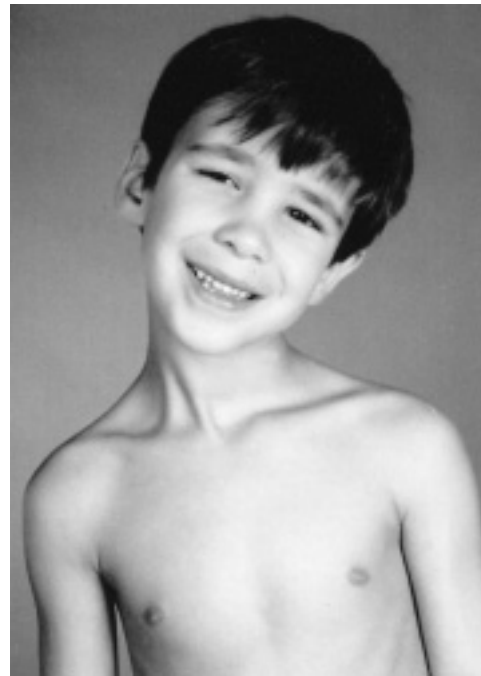


FIGURE 5-12 ■ A Young Boy with Torticollis. Reprinted with permission from Morrissy R: *Lovell and Winter's Pediatric Orthopaedics*. Vol. 2. Baltimore, MD: Lippincott Williams & Wilkins, 2001, p 810.

muscle, which may be caused by a number of different factors, including a twisting of the head to one side in utero during the late stages of pregnancy, birth trauma, visual difficulties that cause the child to tilt the head, inflammatory conditions of the tissues of the neck such as pharyngitis or cellulitis, and very rarely, malformations of the occipital or cervical bones.¹

It is important that torticollis be treated early in life for two reasons: one, it is annoying to the child and can slow down the learning of new skills such as crawling and walking; and two, children can have discomfort and referred pain from triggerpoints in this muscle, which will persist into adulthood if they are not treated. Triggerpoints in other neck muscles may develop, such as in the scalenes, trapezius, levator scapulae, and posterior neck muscles.² Adults with uncorrected torticollis have very restricted mobility of the cervical spine.

When a child is born with torticollis, therapy for the shortened sternocleidomastoid muscle is often prescribed for parents to do at home. It consists of gentle but persistent head flexion and rotation to stretch the muscle. Three or four times daily, the parent or therapist does ten to twenty repetitions, each time holding momentarily at the maximal range. Physical therapy may involve having the child do exercises which stretch the muscle, such as rolling towards the ipsilateral side and doing midline activi-

ties in different positions. Parents are taught to carry the infant outward to encourage her to position her head and neck in the midline, and to turn her crib so that looking at interesting objects will stretch the involved sternocleidomastoid.³ If this gentle stretching is not successful, children with torticollis may have surgery to release the muscle, with postoperative physical therapy and splinting. This is usually done between the ages of 1 and 4 years.^{4,5}

APPROACH AND GOALS

Torticollis, which is related to muscle spasm and triggerpoints, can be addressed with massage, and may be an excellent adjunct to the therapy the child is receiving for torticollis, even with an infant. Thorough massage of the entire neck and shoulders is advised, because a change in the length of the sternocleidomastoid muscle may have affected many other muscles as well.

MASSAGE SEQUENCE FOR TORTICOLLIS

- Step 1. Use the treatment for neck and shoulder tension discussed in this chapter.
- Step 2. Superficial effleurage of the sternocleidomastoid muscle. (Step 3, Sternocleidomastoid Massage, page 128).
- Step 3. Pressure points on the sternocleidomastoid muscle.
- Step 4. Shoulder and neck effleurage, repeat 10 times.
- Step 5. Basic relaxation sequence.
- Step 6. Stretching of the sternocleidomastoid as prescribed by the child's physician. Because this therapy may be difficult to do at one time with a small child, you may teach the child's parents to do some or all of this massage and stretching sequence on a daily basis and have the child brought in for weekly massage.



Because torticollis may have other causes besides the shortening of the sternocleidomastoid muscle, consult with the child's physician for approval to treat the child's torticollis.

REVIEW QUESTIONS

1. Choose three discomforts and explain their causes. Explain how specific treatment with massage and hydrotherapy can work together to treat each discomfort.
2. Explain the causes and manifestations of five different headache types. How are they treated differently with massage and hydrotherapy?
3. Discuss the common causes of neck and shoulder tension. Can massage be a symptomatic treatment for neck and shoulder tension, or can it help deal with the cause? Explain.
4. Name three discomforts discussed in this chapter in which stress may be a major contributor, and explain why. Name three in which stress has nothing to do with the condition, and explain why.
5. Discuss the lifelong lessons that children learn by using massage and hydrotherapy to treat the emotional and physical aspects of the discomforts discussed in Chapter 5, that is by using simple, holistic techniques before trying medications.

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